

2174

**STOPPING
WATER POLLUTION
AT ITS SOURCE**



ACUTE LETHALITY DATA FOR ONTARIO'S
INORGANIC CHEMICAL SECTOR EFFLUENTS
COVERING THE PERIOD FROM
DECEMBER 1989 TO MAY 1990



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PIBS 2174

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DECEMBER 1989 TO MAY 1990

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Contents

| | page |
|---|------|
| Introduction | ii |
| Background | ii |
| Summary | iii |
| Discussion and Conclusions | iv |
| Figures | viii |
| Appendix | |
| Albright and Wilson Americas Inc., Port Maitland | 1 |
| Cabot Canada Ltd., Sarnia | 5 |
| Cyanamid Canada Inc. (Niagara plant), Niagara Falls | 7 |
| Cyanamid Canada Inc. (Welland plant), Niagara Falls | 11 |
| Exolon-Esk Company of Canada Ltd., Thorold | 15 |
| Explosive Technologies Int. Ltd., North Bay | 17 |
| Fiberglas Canada Inc., Sarnia | 19 |
| General Chemical Canada Ltd., Amherstburg | 21 |
| ICI Canada Inc., Cornwall | 26 |
| ICI Canada Inc., Courtright | 28 |
| International Minerals & Chemicals, Port Maitland | 30 |
| Liquid Carbonic Inc., Courtright | 32 |
| Liquid Carbonic Inc., Maitland | 34 |
| Nitrochem Inc., Maitland | 36 |
| Norton Canada Inc., Niagara Falls | 38 |
| Partek Insulations Ltd., Sarnia | 44 |
| Stanchem, Cornwall | 46 |
| Sulco Chemicals Ltd., Elmira | 48 |
| UCAR Carbon Canada Limited, Welland | 50 |
| Union Carbide Canada Ltd., Moore TWP | 54 |
| Union Carbide Canada Ltd., Sarnia | 56 |
| Union Carbide Canada Ltd., Sault Ste. Marie | 58 |
| Washington Mills Electro Minerals, Niagara Falls | 60 |
| Washington Mills Ltd., Niagara Falls | 64 |
| Welland Chemical Ltd., Sarnia | 66 |

Introduction

Under the MISA program, the Inorganic Chemical Sector was required to monitor its discharges (both process and cooling waters) for acute lethality to trout and to *Daphnia magna* by conducting laboratory toxicity tests. This requirement was based on provisions of the Ontario Environmental Protection Act which allowed the Ministry to write regulations requesting persons responsible for sources of contaminants to monitor, record and report to the Ministry. Specific details on the toxicity testing requirements are described in the General Effluent Monitoring Regulation (Ontario Regulation 695/88) and the Effluent Monitoring Regulation For The Inorganic Chemical Sector (Ontario Regulation 395/89). For the purposes of the Monitoring Regulation, the Inorganic Chemical Sector is defined to include all direct discharging plants, primarily engaged in the processing, manufacturing, packaging or blending of inorganic materials. The majority of the companies are located in southern Ontario. The products of the Inorganic industry include acids and bases, caustic soda, soda ash, fertilizers, explosives, carbon black, detergent additives, bleaches and industrial gases. Some of these are used as ingredients to manufacture other commercial products such as dyes, plastics and pharmaceuticals. An overview of this sector in Ontario is described in the publication "The Development Document For The Effluent Monitoring Regulation For The Inorganic Chemical Sector. Environment Ontario July 1989". Toxicity information collected under the MISA effluent monitoring program will form the most comprehensive database available on the Inorganic Chemical Sector and will be used toward the development of compliance limits for acute toxicity. This report presents the toxicity results of the first six months of self-monitoring by the plants along with the results of audit samples that were tested at the Ministry's laboratory in Rexdale. Toxicity tests of some intake waters, although not required by regulation, were also submitted by industry and these have been included in this report.

Background

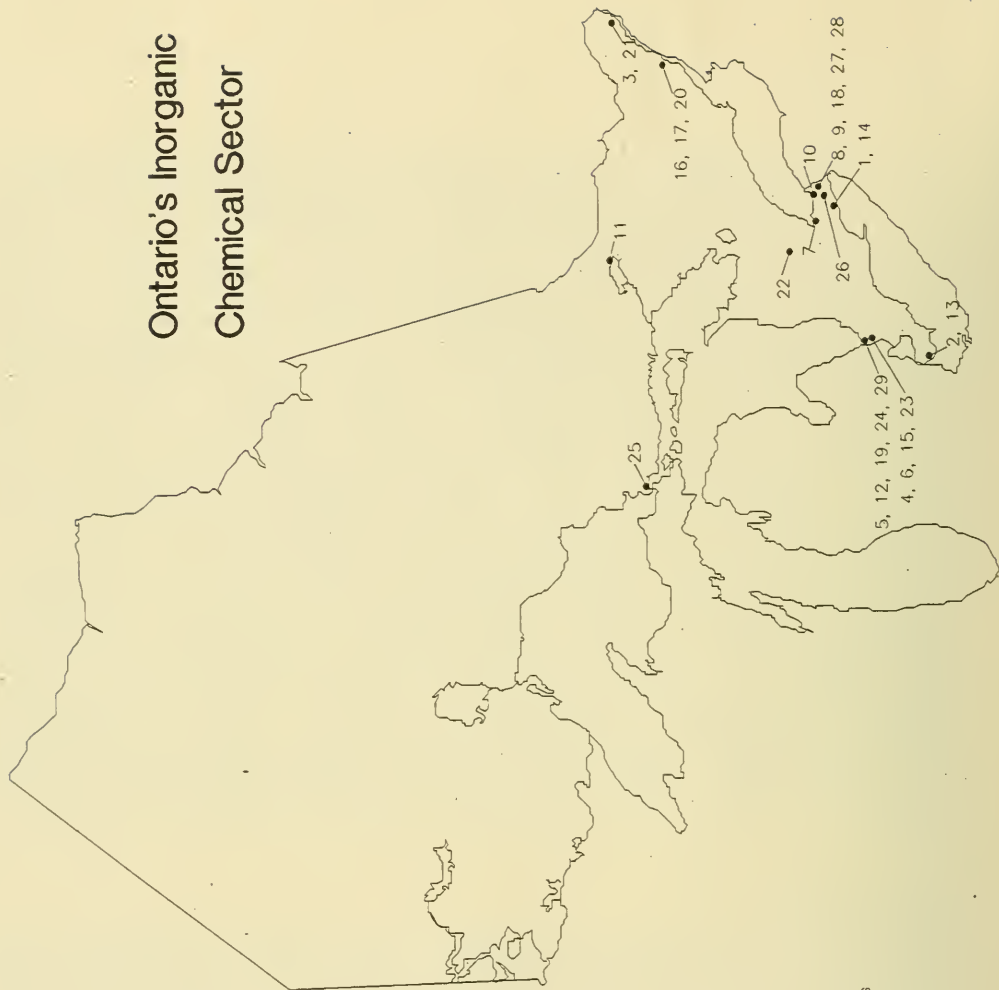
In general, toxicity tests are used as a rapid technique to assess the potential impact of complex effluents on the aquatic environment. In acute lethality toxicity testing, aquatic organisms are exposed to undiluted effluent, and several effluent dilutions, for a fixed period of time. A trout test is a 96 hour exposure and a *Daphnia* test is a 48 hour exposure. For both tests, the number of organisms which have died would be the measured parameter. The LC50 or the estimated concentration of effluent that causes 50 % mortality is generally used as the quantitative measure of toxicity. For complex waste water samples, the LC50 measurement is usually expressed as a percentage of effluent volume. For example, a 96 hour LC50 = 35.0 % can be explained as the percent by volume of effluent required to kill 50 % of the test fish within the 96 hour exposure period.

As directed by the Effluent Monitoring Regulation, the Inorganic Chemical Sector was required to collect and provide information on their operations including analytical

No. Name Location

1. Albright and Wilson Americas Inc., Port Maitland
2. Allied Chemicals Canada Inc., Amherstburg
3. CIL Inc., Cornwall
4. CIL Inc., Courtwright
5. Cabot Canada Ltd., Sarnia
6. Canadian Liquid Air Ltd., Courtwright
7. Columbian Chemicals Canada Ltd., Hamilton
8. Cyanamid Canada Inc., (Niagara Plant)
Niagara Falls
9. Cyanamid Canada Inc. (Welland Plant)
Niagara Falls
10. Exalon-Esk Company of Canada Ltd., Thorold
11. Explosive Technologies Int. Ltd., North Bay
12. Fiberglas Canada Inc., Sarnia
13. General Chemicals Ltd., Amherstburg
14. International Minerals & Chemicals,
Port Maitland
15. Liquid Carbonic Inc., Courtwright
16. Liquid Carbonic Inc., Maitland
17. Nitrochem Inc., Maitland
18. Norton Canada Inc., Niagara Falls
19. Partek Insulations Ltd., Sarnia
20. Puritan Bennett Canada Ltd., Maitland
21. Stanchem, Cornwall
22. Sulco Chemicals Ltd., Elmira
23. Union Carbide Canada Ltd., Moore TWP
24. Union Carbide Canada Ltd., Sarnia
25. Union Carbide Canada Ltd., Sault Ste. Marie
26. Union Carbide Inc., Welland
27. Washington Mills Electro Minerals, Niagara Falls
28. Washington Mills Ltd., Niagara Falls
29. Welland Chemical Ltd., Sarnia

Ontario's Inorganic Chemical Sector



chemical characterization and toxicity analysis conducted on their waste water discharges. The timing of toxicity sampling was arranged to coincide with chemical characterization. The frequency of sampling was monthly for both toxicity test procedures on process effluents with the exception that if tests over three consecutive months showed insignificant mortalities with trout then in subsequent months a single concentration trout test may be used. For cooling water effluent, the required frequency of sampling and testing was quarterly. All acute lethality testing was conducted according to Ministry protocols (Protocol To Determine The Acute Lethality Of Liquid Effluents To Fish Env. Ontario July 1983 and *Daphnia magna* Acute Lethality Toxicity Test Protocol Env. Ontario April 1988). The regulations also required specific information on sampling and testing procedures for each bioassay, in addition to the mortality data, to be reported in an electronic and hardcopy report. The Ministry's TOXDATA computer program was provided to industry as a method of managing toxicity data and as a route of data submission. Additional information on this computer program is provided in the publication titled "Toxicity Relational Database System TOXDATA User's Manual Environment Ontario May 1989".

Summary

The Inorganic Chemical Sector submitted acute lethality results for 42 sampling locations at a total of 26 companies. For the first six months of monitoring, starting in December 1989 and ending May 1990, a total of 353 trout and *Daphnia* toxicity test results were submitted by the companies and 29 audit tests were conducted by the Ministry. Liquid Carbonic Inc. (Courtright), Liquid Carbonic Inc. (Maitland), Puritan Bennett Canada Ltd. (Maitland), Union Carbide Canada Ltd. (Moore Twnshp), Union Carbide Canada Ltd. (Sarnia), and Union Carbide Canada Ltd., (Sault Ste. Marie) were all brought under monitoring through regulation amendments after the initial promulgation date. Therefore, there were limited samples to review for these companies. Three companies, Allied Chemicals Canada Inc. (Amherstburg), Canadian Liquid Air Ltd. (Courtright), and Columbian Chemicals Ltd. (Hamilton) were not required to monitor for acute toxicity during the Monitoring Regulation period. These plants were considered exempt from acute toxicity monitoring since they did not discharge process effluent directly into the natural environment. Allied Chemicals Canada Incorporated's process effluent is combined with General Chemical Canada effluent streams and Columbian Chemicals Ltd.'s effluent was only stormwater runoff. Albright and Wilson Americas Inc. (Port Maitland), General Chemical Canada Ltd. (Amherstburg) and Welland Chemical Ltd. (Sarnia) voluntarily submitted test results for tests conducted on intake water samples.

The data collected during the first six months of monitoring indicate the majority of inorganic chemical plants' effluent samples were not acutely lethal. Approximately 82 % of the samples tested for trout acute lethality and 73 % of the samples tested for *Daphnia* acute lethality were non-lethal or had marginal lethality (LC50s > 100 % effluent)(see figures 11 & 13). Non-lethal effluents are considered less likely to produce adverse

impacts in the environment after dilution by the receiving water. Although the majority of the samples when tested were shown to have been non-lethal, only a small percentage (36 % for trout and 18 % for *Daphnia*) of the companies reported that their effluents were non-lethal for all the samples collected (see figures 10 & 12) over the six month period . Companies which reported consistently non-lethal trout bioassay results include: Explosives Technologies Int. - North Bay, ICI Canada Inc. (formerly CIL Inc.) - Cornwall, ICI Canada Inc. (formerly CIL Inc.) - Courtright, Liquid Carbonic Inc. - Courtright, Liquid Carbonic Inc. - Maitland, Union Carbide Ltd. - Moore TWP, Union Carbide Canada Ltd. - Sault Ste. Marie, Washington Mills Electro Minerals - Niagara Falls and Washington Mills Ltd. - Niagara Falls. Companies which reported non-lethal *Daphnia* bioassay results include : Cabot Canada Ltd. - Sarnia, ICI Canada Inc. - Cornwall, Liquid Carbonic Inc. - Courtright and Union Carbide Canada Ltd. - Moore TWP. Most of the samples that were determined to have been acutely lethal to trout and/or *Daphnia* were collected from sites at the following eight companies: General Chemical Canada Ltd. - Amherstburg, Stanchem - Cornwall, Cyanamid Canada Inc.(Welland Plant) - Niagara Falls, Norton Canada Inc. - Niagara Falls, Nitrochem Inc. - Maitland, Welland Chemicals Ltd. - Sarnia, Partek Insulations Ltd. - Sarnia, and Union Carbide Canada Ltd. - Sarnia. All these companies reported that one or more of their discharges were acutely lethal for at least 50 % of samples collected and were toxic to either/both trout and *Daphnia*. The trout and *Daphnia* toxicity data (LC50s) for these eight dischargers are plotted in Fig. 1 - 9. Note that low values of LC50 mean high acute toxicity. Overall, the effluents were more toxic to *Daphnia* than to rainbow trout. Effluents from thirteen companies were acutely lethal to *Daphnia*, while only eight of these were lethal to fish. There was only one discharge which was lethal to fish and not lethal to *Daphnia*. Also effluents which were lethal to both test species appeared to exhibit greater effect on *Daphnia magna* than on trout. For example, see figure 1 - Acute Toxicity for General Chemical Canada Ltd. The *Daphnia* LC50s were always lower than trout values, showing *Daphnia* to have a greater sensitivity to the effluent toxicity. For other discharges, the species related sensitivity is not as discernable. For example, see figure 5 - Acute toxicity for Nitrochem Incorporated. For these samples, the trout and *Daphnia* results were similar. The effluent samples collected from Nitrochem Inc.(final effluent) were consistently the most toxic in this sector. The *Daphnia* and trout LC50s were, for the majority, were less than 10 % effluent.

Discussion and Conclusions

The first six months of MISA acute toxicity data indicated the majority of inorganic chemical manufactures' effluent samples were not acutely lethal. Although the number of lethal effluents were few, they were distributed amongst several companies in the sector. Only nine of the twenty-six companies which submitted acute trout toxicity data had non-lethal effluents throughout the period. Four of twenty-five companies had consistently non-lethal results when tested with *Daphnia magna*. Only three companies, ICI Canada Inc.- Cornwall, Liquid Carbonic Inc.- Courtright and Union Carbide Canada Ltd.- Moore Township , reported non-lethal results for both *Daphnia* and trout tests throughout the

period. The following five companies reported one or more of their discharge site(s) were acutely lethal the majority of the time when sampled and were toxic to both trout and *Daphnia*; General Chemical Canada Ltd. - Amherstburg, Stanchem - Cornwall, Nitrochem Inc. - Maitland, Welland Chemicals Ltd. - Sarnia, and Partek Insulations Ltd. - Sarnia.

For several of the toxic samples, a quick review of the matching analytical chemistry monitoring data revealed some probable causes of the observed acute toxicity. Where this was possible, a brief explanation to the probable causes of toxicity has been described below. However for some acutely lethal samples that were collected from Partek Insulations Ltd., Welland Chemical Ltd., Norton Canada Inc., and Union Carbide Canada Ltd., the cause of toxicity were not conclusive.

General Chemical Canada Ltd., Amherstburg

General Chemical Canada Ltd. produces soda ash (sodium carbonate) from common salt and discharges their wastewater into the Detroit River via the Main Drain and the North Drain. The North Drain is also used to discharge wastewater from the Genetron and Hydrofluoric acid plants operated by Allied Chemicals Canada Inc. (Allied plants will be shut down in 1992). The effluent samples from the Main Drain were consistently non-lethal to *Daphnia magna* and trout while the effluent samples from the North Drain were consistently acutely lethal to both species. LC50s for the trout bioassays ranged from 20 to 40 % effluent, while all the *Daphnia* LC50s were reported as less than 10 % effluent. The toxicity can be attributed to several aspects of the North Drain effluent quality. The alkaline condition of the wastewater, alone, could account for the observed lethality. The pH measurements for the North Drain wastewater were consistently above 11.5 on the days when toxicity samples were collected. Usually water with a measured pH higher than 10.5 would be acutely lethal both *Daphnia* and trout. The effluent samples also contained concentrations of unionized ammonia, ranging from 1.3 to 5.7 ppm on days when toxicity samples were collected which could have contributed to the acute lethality. General Chemical's effluent contained very high concentrations of chloride ions, as much as 47,900 ppm. Chlorides are found in practically all natural waters and are not usually considered a hazardous contaminant. However, the concentrations of chloride discharged at this site are well above levels which would kill fish and would have contributed to the lethality observed in the bioassays. Sensitivity to chloride varies amongst fish species, trout will be killed at 1000 ppm chloride while carp could survive at 4000 ppm.

Stanchem, Cornwall

Stanchem operates a filling and packaging facility in Cornwall. It packages a number of products such as liquid chlorine, sulfur dioxide, anhydrous ammonia, hydrochloric acid and sulfuric acid. Wastewater from the facility is discharged into the St. Lawrence River via the Brookdale Avenue sewer in Cornwall. Stanchem calculates that the actual concentration of the Stanchem effluent in the Brookdale sewer is < 0.5 % of the total flow during the 1.5 hours per day that it is discharged. Like General Chemical's effluent, Stanchem's effluent contains several contaminants which could have contributed to the

observed lethality in the bioassays. However most of the toxicity can be attributed to the ammonia and hydrogen ion concentrations. Calculated un-ionized ammonia concentrations exceeded 2 mg/L. for several samples. This concentration would be rapid lethal to trout or *Daphnia*. The acidity of the effluent, sometimes measuring as low as pH 3.8, would also have been rapidly lethal to both *Daphnia* and trout. For several samples, the concentrations of copper and zinc were measured to exceed concentrations known to be acutely lethal.

Cyanamid Canada Inc., (Welland Plant), Niagara Falls

Cyanamid Canada Inc. manufactures inorganic nitrogen and phosphorous products (ammonia, dicyandiamid) and discharges the wastewater into the Niagara River via Thompson's Creek and the Welland River. The plant's effluent was acutely lethal to *Daphnia magna* throughout the sampling period while only occasionally lethal to trout. It is suspected that the lethality is caused by episodic discharges of cyanide in concentrations over 100 ppb.

Nitrochem Inc., Maitland

Nitrochem Inc., located near Maitland, manufactures ammonia, nitric acid, ammonium nitrate and other nitrogen solutions. Nitrochem's wastewater is discharged directly into the St. Lawrence River. The final effluent was determined to have been consistently acutely lethal to *Daphnia magna* and to rainbow trout throughout the monitoring period. This was due to high concentrations of ammonia and cyanide in the effluent. Un-ionized ammonia levels were above 50 ppm for discharge # 400 on several of the days when toxicity samples were collected. Cyanide concentrations were also measured at levels known to cause rapid lethality to aquatic animals.

Welland Chemicals Ltd., Sarnia

Welland Chemicals Ltd., located in Sarnia, manufactures anhydrous aluminum chloride, sodium hypochlorite, and packages chlorine gas. Welland Chemical's wastewater is discharged through several discharge points into the St. Clair River via Talford Creek. The effluent from all discharge points were determined to have been consistently lethal to *Daphnia*, while only with the South Lagoon effluent and the #1 Lagoon effluent were there a similar response elicited with trout. It is unclear as to the cause of the observed lethality in the bioassays, although several toxic contaminants were measured at lethal concentrations.

The toxicity tests will detect harmful concentrations and mixtures of most chemical constituents of effluents. But compliance with "end of pipe" limits for acute toxicity would not necessarily control the potential effects of environmental contamination that can be caused by the loading of bioaccumulative substances. These substances are generally nonpolar organic chemicals of high molecular weight and low water solubility or metals that can be accumulated in its organic form. For this industrial sector, several of these contaminants can be measured in the effluents at sublethal concentrations. This list

includes cadmium, lead, mercury, octachlorostyrene, dioxins and hexachlorobenzene; all of which are of environmental concern.

The body of this report, presents the summaries of the acute lethality data, grouped by company and placed in alphabetical order. These summary pages are part of the complete database, that includes the Toxicity Test Report submitted by industry for each test sample. The complete database is available from Environment Ontario upon request. The fields on individual Toxicity Test Reports were entered by the industry's laboratory performing the tests, and should not be expected to be consistent across samples and do not necessarily represents the views of the Ministry.

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Craig, G., K. Flood, J. Lee, and M. Thomson. 1983. Protocol to determine the acute lethality of liquid effluents to fish. Queen's Printer for Ontario. 9pp.

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Poirier, D.G., G.F. Westlake, and S.G. Abernathy. 1988. *Daphnia magna* acute lethality toxicity test protocol. Queen's Printer for Ontario. 11 pp.

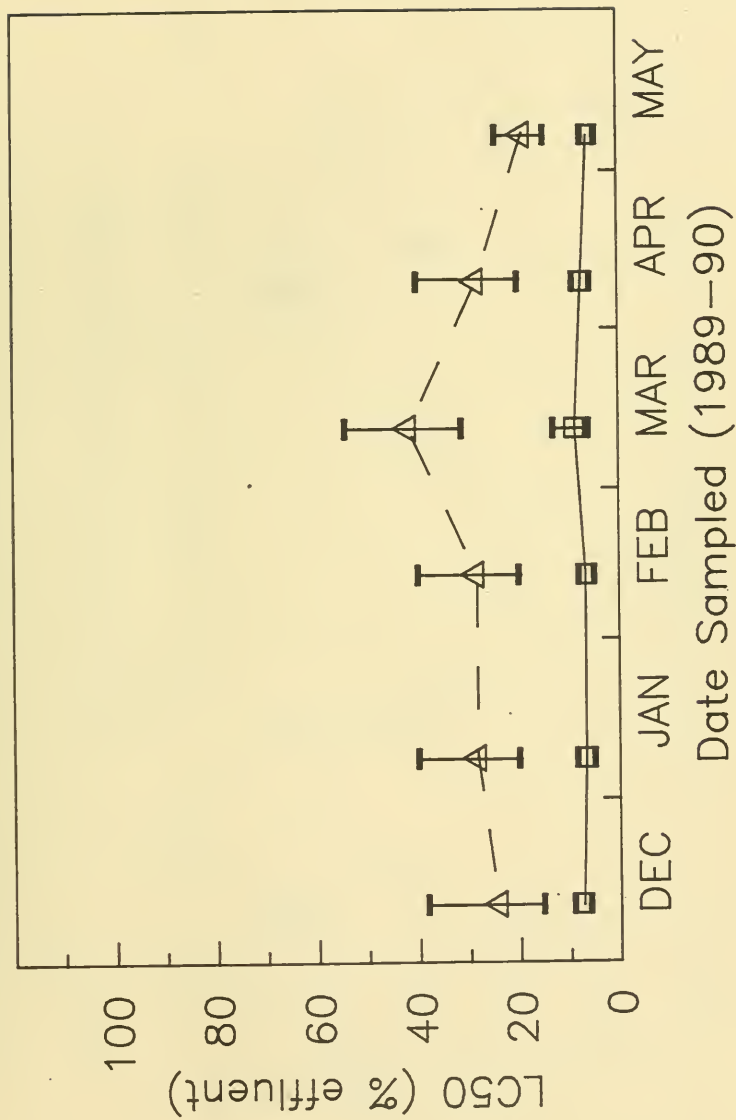


Figure 1. Acute Toxicity of Effluent Samples from discharge #100 at General Chemical Canada Ltd., Amherstburg. (Δ Trout \square *Daphnia magna*)

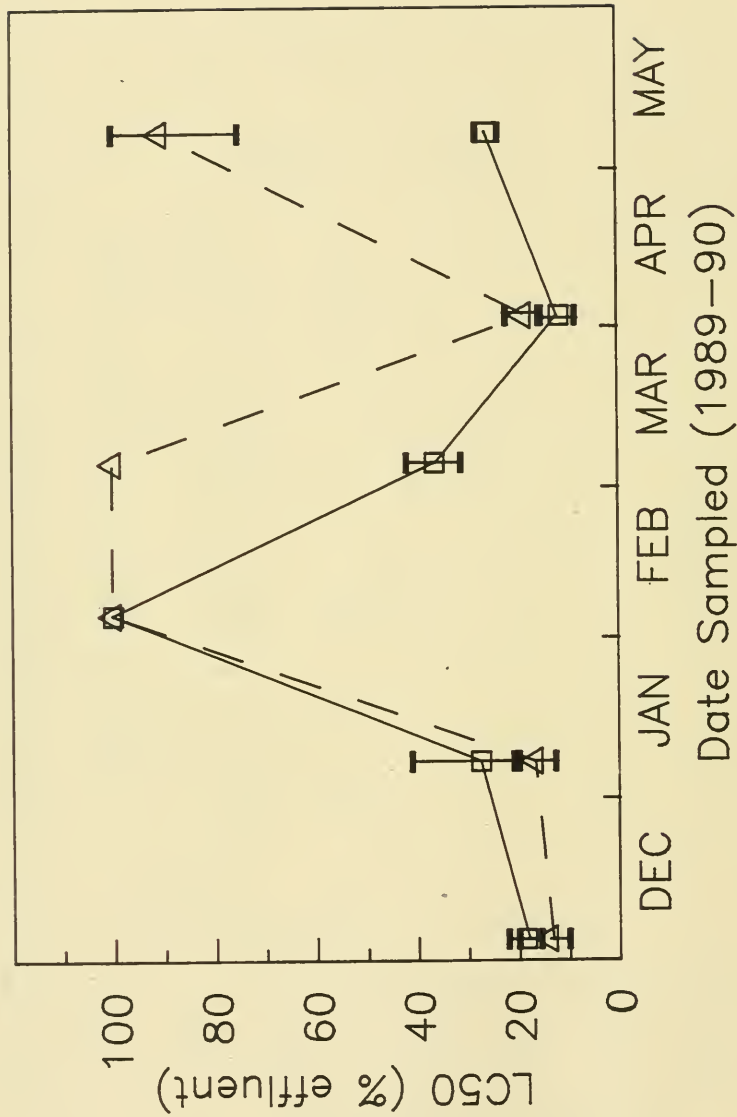


Figure 2. Acute Toxicity of Effluent Samples from discharge #100 at Stanchem Cornwall.
(Δ Trout \square Daphnia magna)

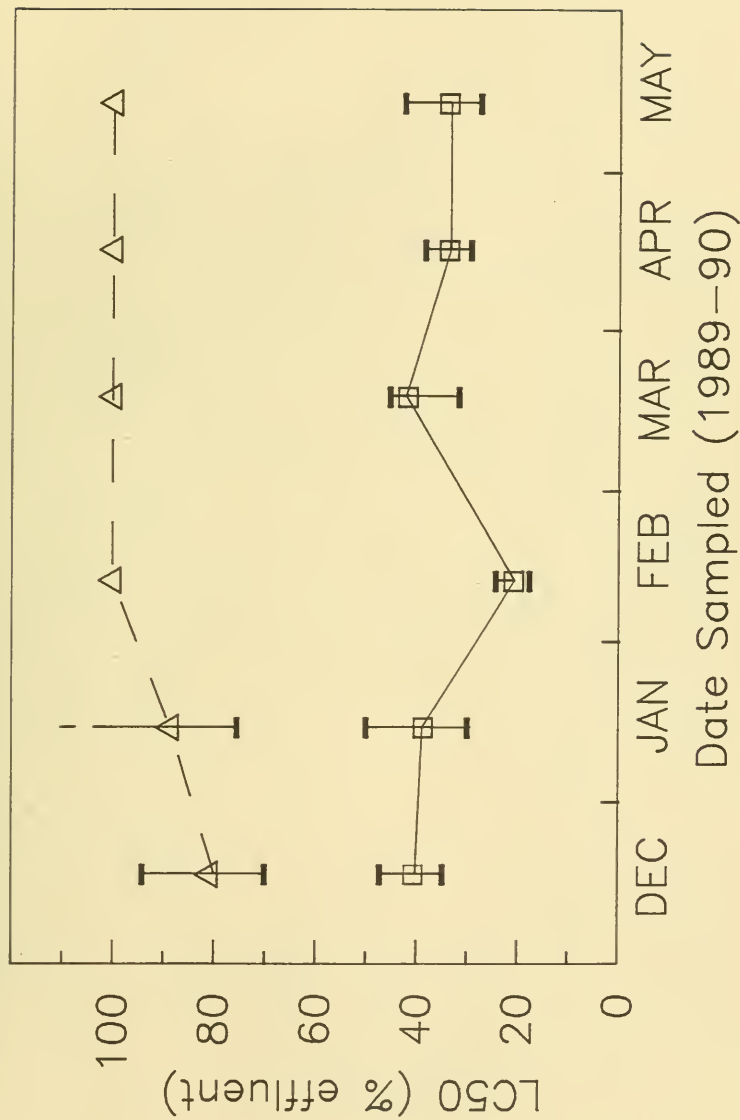


Figure 3. Acute Toxicity of Effluent Samples from discharge #200 at Cyanamid Canada Inc., (Welland Plant). (Δ Trout □ *Daphnia magna*)

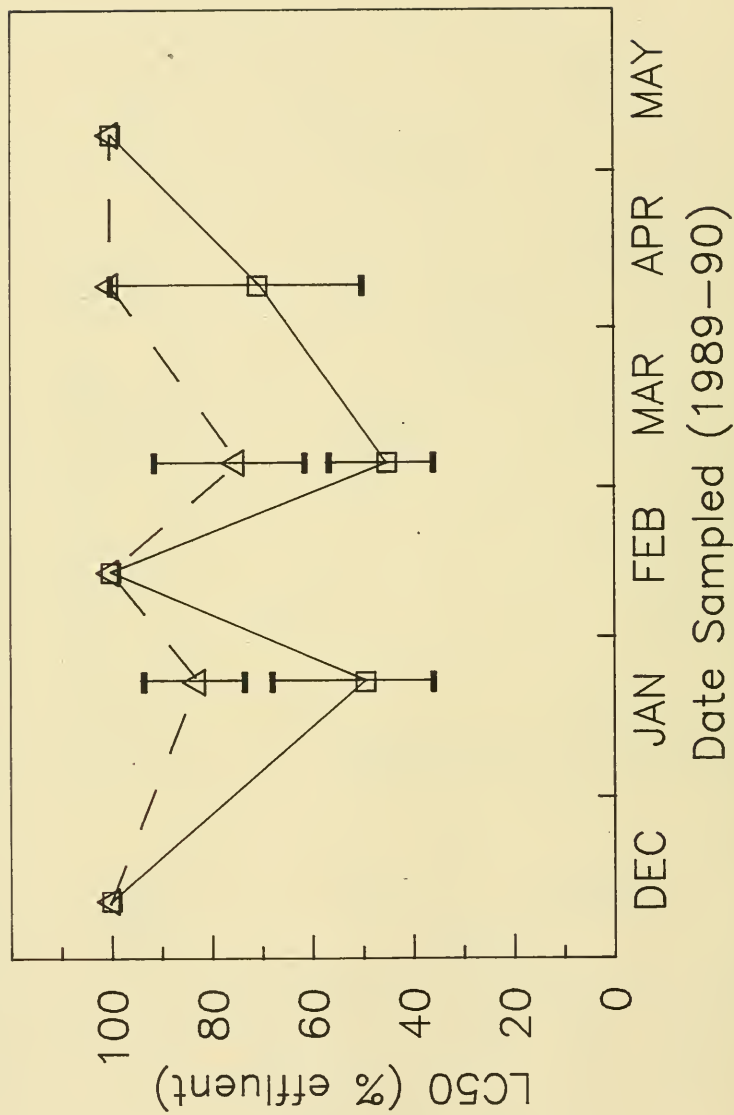


Figure 4. Acute Toxicity of Effluent Samples from discharge #300 at Norton Canada Incorporated, Niagara Falls. (Δ Trout \square *Daphnia magna*)

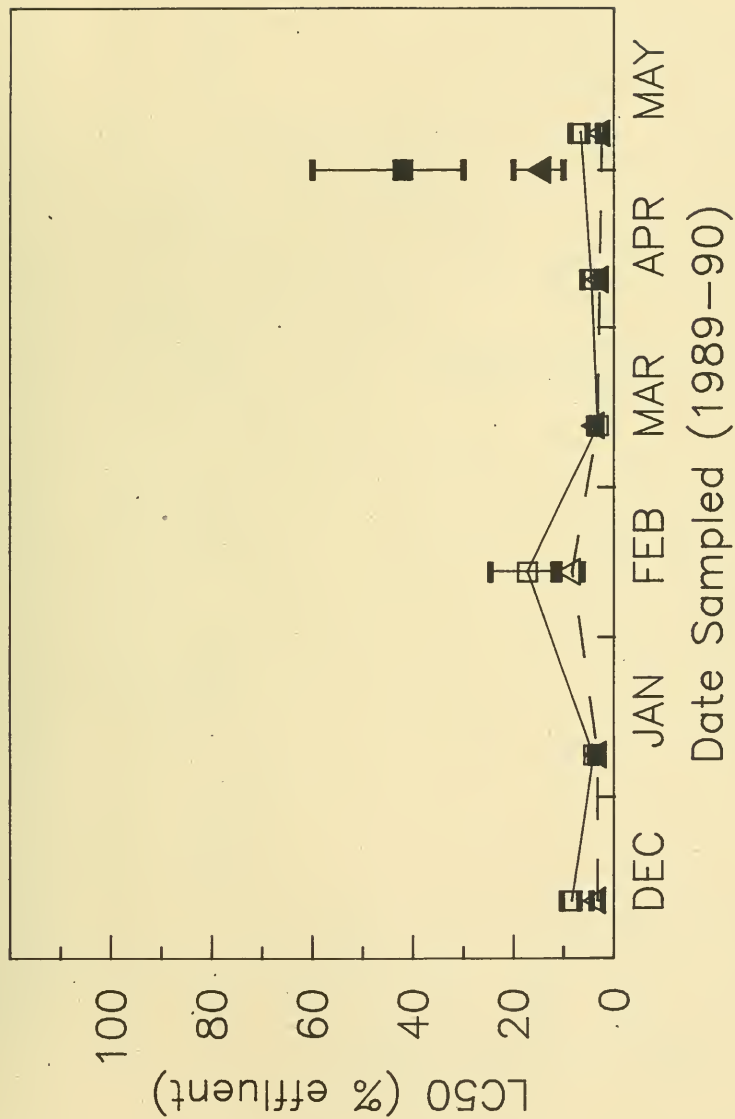


Figure 5. Acute Toxicity of Effluent Samples from discharge #400 at Nitrochem Incorporated, Maitland. (Δ Trout □ Daphnia magna) Solid symbols are MISA audits.

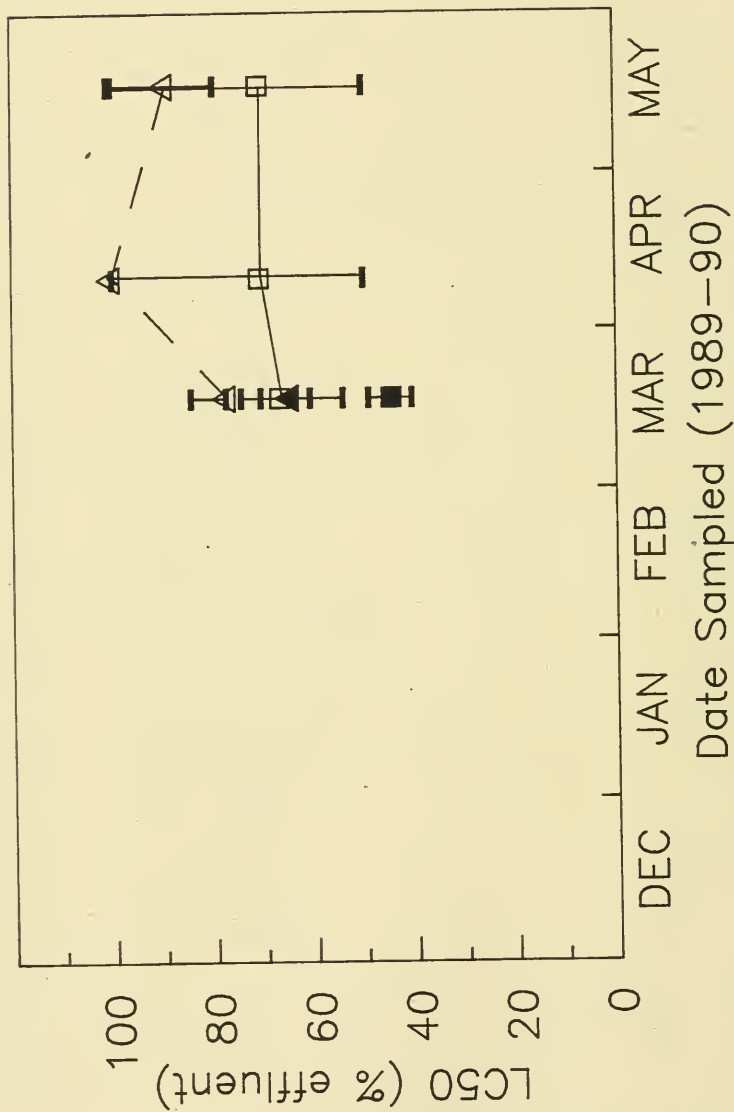


Figure 6. Acute Toxicity of Effluent Samples from discharge #100 at Welland Chemicals Limited, Sarnia. (Δ Trout \square Daphnia magna) Solid symbols are MISA audits.

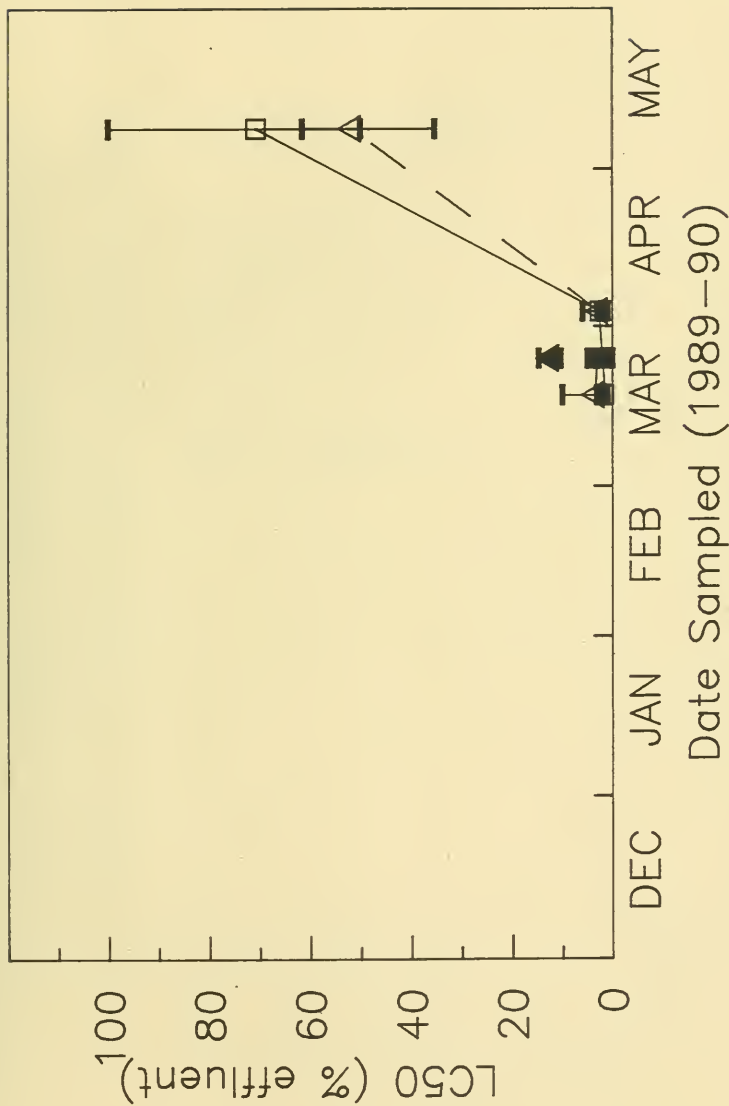


Figure 7. Acute Toxicity of Effluent Samples from discharge No.1 Lagoon at Welland Chemicals Limited, Sarnia. (Δ Trout \square Daphnia magna) Solid symbols are MISA audits.

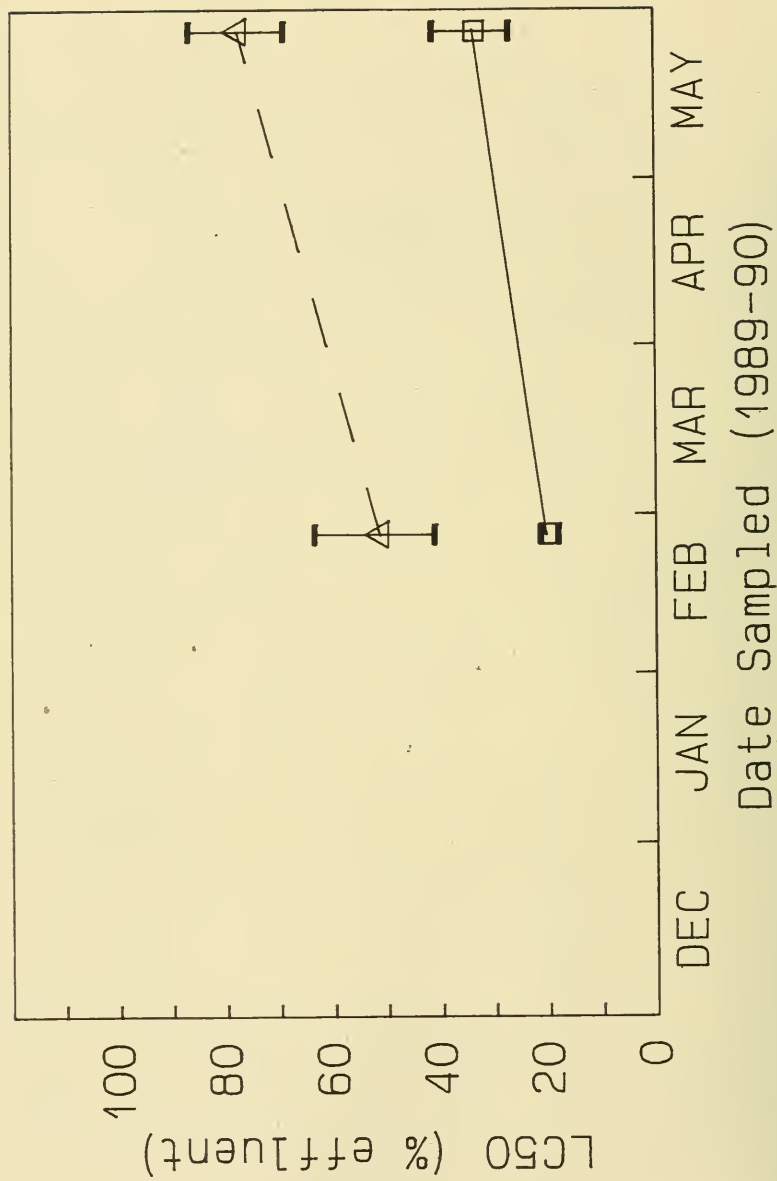


Figure 8. Acute Toxicity of Effluent Samples from C Water Overflow at Partek Insulations Ltd., Sarnia (Δ Trout \square Daphnia magna)

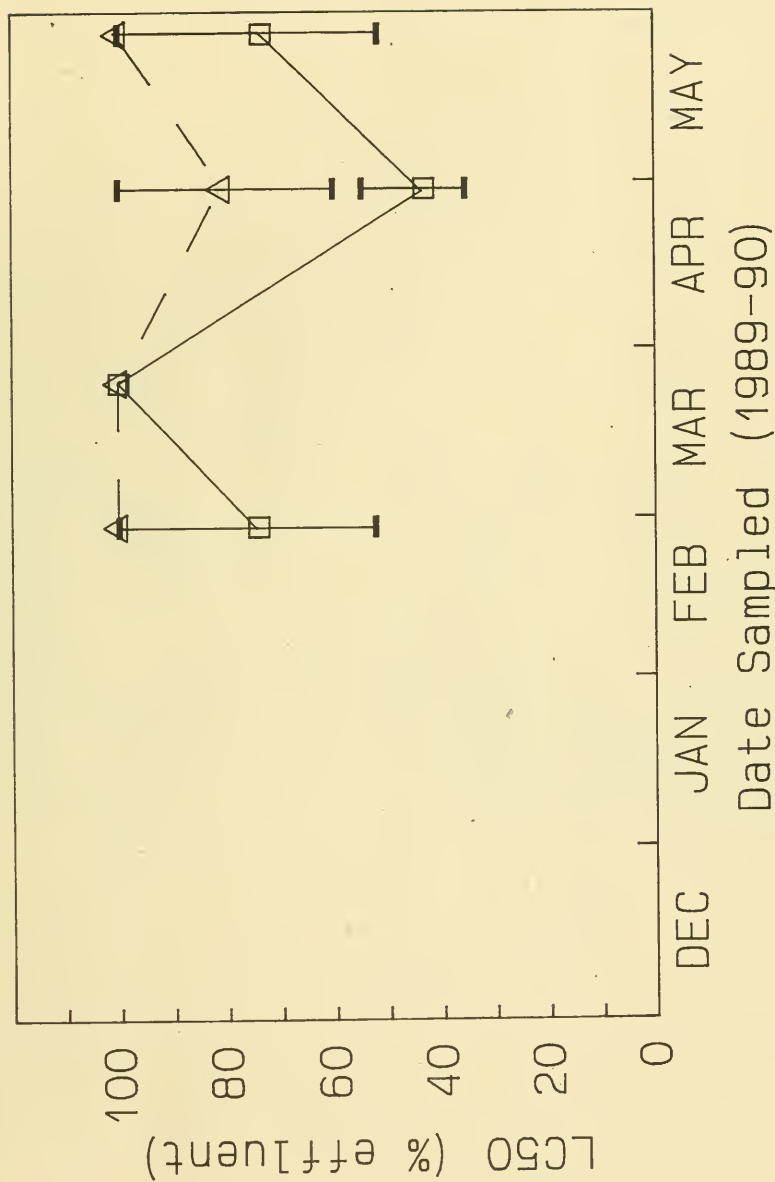


Figure 9. Acute Toxicity of Effluent Samples from Cole Drain at Union Carbide Canada Ltd., Sarnia
(Δ Trout \square *Daphnia magna*)

Fig. 10 Percentage of Inorganic Sector
Toxic to Rainbow Trout

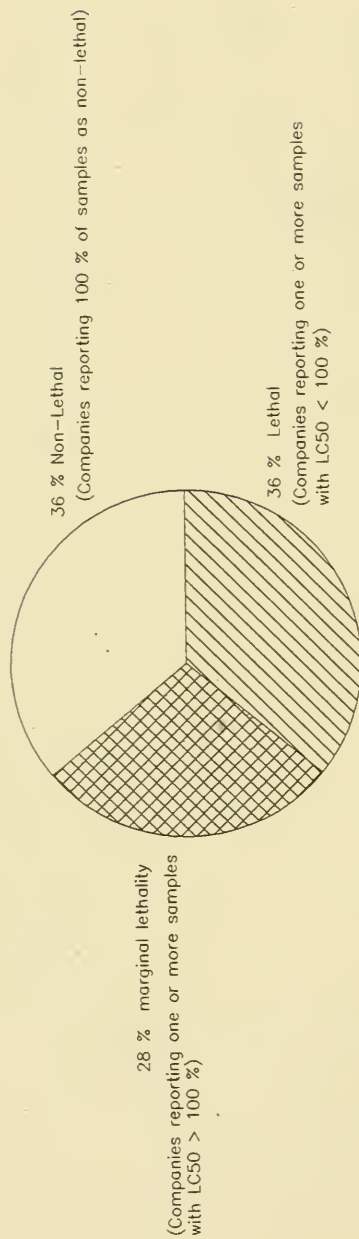


Fig. 11 Percentage of Samples
Toxic to Rainbow Trout

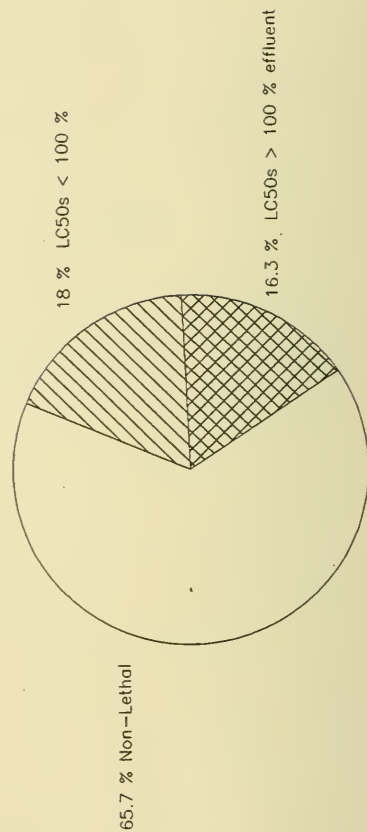


Fig. 12 Percentage of Inorganic Sector
Toxic to *Daphnia magna*

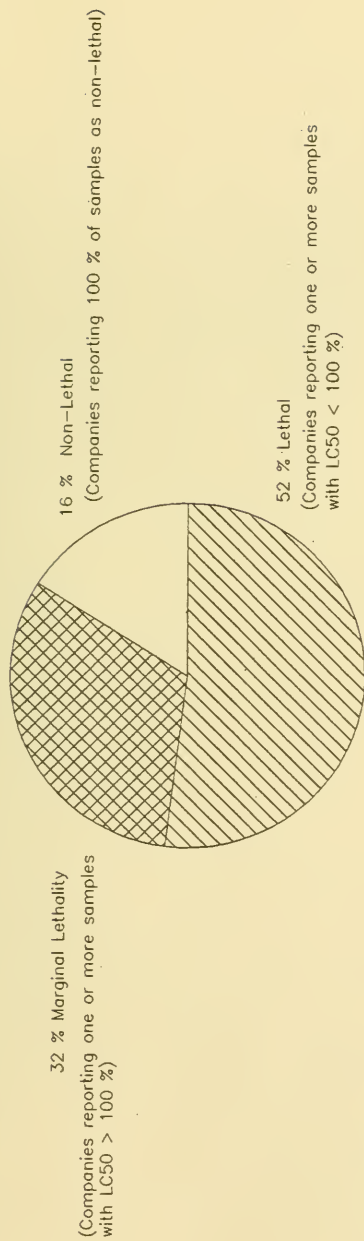
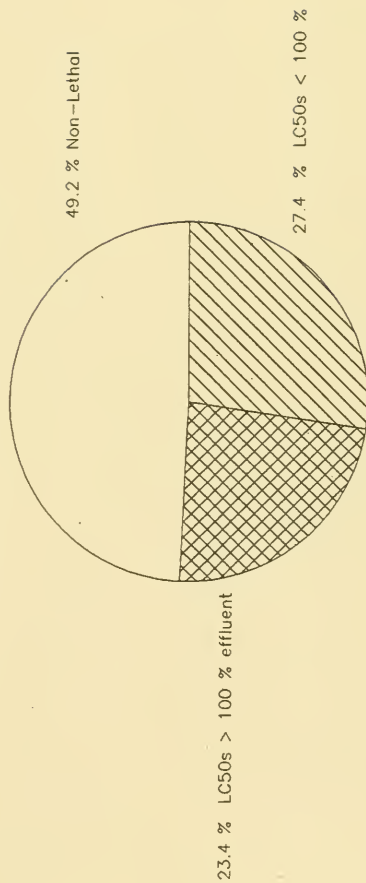


Fig. 13 Percentage of Samples
Toxic to *Daphnia magna*



Appendix

COMPANY: Albright and Wilson Americas Inc., Port Maitland
(1810001)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for six trout bioassays, conducted on final discharge effluent samples collected between December 1989 and May 1990, were provided by Albright and Wilson Americas Incorporated. Four of the six effluents samples were not acutely lethal to test fish. The other two samples produced 96 hour LC50s > 100 % effluent. A Ministry audit sample collected in May also had a 96 hour LC50 > 100 % effluent. Additional samples collected from the Intake supply were non-lethal.

Final Discharge

06891292 sampled: 12/13/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900105 sampled: 01/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900277 sampled: 02/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900398 sampled: 03/14/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN FULL STRENGTH EFFLUENT

06900546 sampled: 04/25/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01900088 sampled: 05/14/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

06900604 sampled: 05/16/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN FULL STRENGTH CONCENTRATION

Albright and Wilson Americas Inc. (continued)

Storm Culvert #1

SIDDALL Storm Ditch

Intake Water

06891290 sampled: 12/13/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900103 sampled: 01/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900279 sampled: 02/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900400 sampled: 03/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900544 sampled: 04/25/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900602 sampled: 05/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Rain Gauge

COMPANY: Albright and Wilson Americas Inc., Port Maitland
(1810001)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results for twelve Daphnia magna acute lethality toxicity tests conducted on samples of Final Discharge (#100) and Intake Water (#400) were submitted by Albright and Wilson Americas Inc. of Port Maitland. Five of six samples of Final Discharge were not acutely lethal to Daphnia. The April sample had a 48 h LC50 of 80.6%. Five of Six samples of Intake Water were non-lethal, and the April sample had an LC50 of 77.9%.

One sample of Final Discharge collected in May was tested in the Ministry laboratory, and was not acutely lethal to Daphnia.

Final Discharge

06891293 sampled: 12/13/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900106 sampled: 01/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900278 sampled: 02/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900399 sampled: 03/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900547 sampled: 04/25/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: COMPLETE MORTALITY IN FULL STRENGTH EFFLUENT

02900088 sampled: 05/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

06900605 sampled: 05/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Albright and Wilson Americas Inc. (continued)

Storm Culvert #1

SIDDALL Storm Ditch

Intake Water

06891291 sampled: 12/13/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900104 sampled: 01/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900280 sampled: 02/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900401 sampled: 03/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900545 sampled: 04/25/90 LC50: 77.9 %
95% fid. limits: 72.9 - 83.1 %
comments: 100% MORTALITY IN FULL STRENGTH SAMPLE

06900603 sampled: 05/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Rain Gauge

COMPANY: Cabot Canada Ltd., Sarnia
(4260006)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for six trout bioassays, conducted on control point #100 discharge samples collected between December 1989 and May 1990, were provided by Cabot Canada Ltd. Four of the six samples were not acutely lethal to the test fish. The other two samples had 96 hour LC50s > 100 % effluent.

Discharge

05890130 sampled: 12/13/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

05900007 sampled: 01/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900037 sampled: 02/14/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% Control Mortality-Valid but Questionable

05900057 sampled: 03/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900084 sampled: 04/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900105 sampled: 05/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Pump Station K

Rain Gauge

Intake Water

COMPANY: Cabot Canada Ltd., Sarnia
(4260006)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

Results for six Daphnia magna acute lethality toxicity tests conducted on samples of Discharge Effluent (#100) were submitted by Cabot Canada Ltd. of Sarnia. All six samples were not acutely lethal to Daphnia.

Discharge

05890130 sampled: 12/13/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900007 sampled: 01/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900037 sampled: 02/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900057 sampled: 03/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900084 sampled: 04/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900105 sampled: 05/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Pump Station K

Rain Gauge

Intake Water

COMPANY: Cyanamid Canada Inc.(Niagara plant), Niagara Falls
(1550003)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for 13 trout bioassays, conducted on samples of Whitty Creek Final effluent, Hydro Canal effluent, cooling pond overflow, and south fork sewer effluent collected between December 1989 and May 1990, were provided by Cyanamid Canada Incorporated. Four of the five Whitty Creek samples were determined to have been non-acutely lethal to test fish. The remaining sample produced a 96 hour LC50 result of > 100 % effluent. A Ministry audit sample collected in January was also determined to have been non-lethal. Four of the six Hydro Canal effluent samples were determined to have been non-acutely lethal. The other two samples produced 96 hour LC50s of >100 % effluent. A Ministry audit sample collected in January was also non-lethal. Both cooling pond overflow and south fork sewer effluent samples were non-lethal to the test fish.

Whitty Creek Final Effl

| | | |
|------------------|---------------------------------------|--------------|
| 03890382 | sampled: 12/19/89 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non-lethal | |
| 03900039 | sampled: 01/16/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | LC50 >100 | |
| 01900009 | sampled: 01/23/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | MISA audit sample. | |
| 03900132 | sampled: 02/20/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non-lethal | |
| 03900225 | sampled: 03/20/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Single Concentration Test; non-lethal | |
| 03900310 | sampled: 04/17/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non lethal; single concentration test | |

Cyanamid Canada Inc. (Niagara plant) (continued)

Effluent to Hydro Canal

03890383 sampled: 12/19/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900040 sampled: 01/16/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

01900010 sampled: 01/23/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

03900133 sampled: 02/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900226 sampled: 03/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

03900309 sampled: 04/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal; single concentration test

03900398 sampled: 05/15/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: Lethal; 5% mortality @ 100% effluent conc.

Rain Gauge

Intake Water

cooling pond overflow

03900399 sampled: 05/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

south fork sewer

03900400 sampled: 05/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

COMPANY: Cyanamid Canada Inc.(Niagara plant), Niagara Falls
(1550003)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results from thirteen Daphnia magna acute lethality toxicity tests conducted on samples from four separate outfalls were submitted by Cyanamid Canada Inc. (Niagara Plant) of Niagara Falls. Three of five samples from Whitty Creek Final Effluent (#100) were not acutely lethal to Daphnia, and two samples had 48 h LC50s > 100%. Five of six samples from the Effluent to the Hydro Canal (#200) had LC50s > 100%, and one sample was non-lethal. The one sample from the Cooling Pond Overflow (#500) had an LC50 > 100%, and the one sample from the South Fork Sewer (#600) was non-lethal.

Audit tests were conducted in the Ministry laboratory on samples collected in January. The sample from Whitty Creek Final Effluent was not acutely lethal to Daphnia, and the sample from the Effluent to the Hydro Canal had an LC50 > 100%.

Whitty Creek Final Effl

| | | |
|------------------|-------------------|--------------|
| 03890382 | sampled: 12/19/89 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | LC50 >100% | |
| 03900039 | sampled: 01/16/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non-lethal | |
| 02900009 | sampled: 01/23/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | MISA Audit | |
| 03900132 | sampled: 02/20/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non-lethal | |
| 03900225 | sampled: 03/20/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non lethal | |
| 03900310 | sampled: 04/17/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |

Cyanamid Canada Inc. (Niagara plant) (continued)

Effluent to Hydro Canal

| | | |
|------------------|--------------------------------------|--------------|
| 03890383 | sampled: 12/19/89 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | LC50 >100% | |
| 03900040 | sampled: 01/16/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | LC50 >100 | |
| 02900010 | sampled: 01/23/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | MISA Audit | |
| 03900133 | sampled: 02/20/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | LC50 >100 | |
| 03900226 | sampled: 03/20/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non lethal | |
| 03900309 | sampled: 04/17/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 03900398 | sampled: 05/15/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | No concentration/effect relationship | |

Rain Gauge

Intake Water

cooling pond overflow

| | | |
|------------------|-------------------|--------------|
| 03900399 | sampled: 05/15/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | LC50 > 100 | |

south fork sewer

| | | |
|------------------|-------------------|------------|
| 03900400 | sampled: 05/15/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non lethal | |

COMPANY: Cyanamid Canada Inc.(Welland plant), Niagara Falls
(1550102)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for eight trout bioassays, conducted on Miller's Creek effluent and Dicy cooling water effluent samples collected between December 1989 and May 1990, were provided by Cyanamid Canada Incorporated. Two of the six Miller's Creek samples were determined to have been acutely lethal to test fish. The 96 hour LC50s for the December and January samples were 80.7 and 88.5 % respectively. Of the remaining four samples, three were non-lethal and one produced a 96 hour LC50 result of >100 % effluent. The two Dicy cooling water samples when tested produced 96 hour LC50s of > 100 % effluent.

Millers Cr

06891301 sampled: 12/18/89 LC50: 80.7 %
95% fid. limits: 70.0 - 94.0 %
comments: 10% MORTALITY IN 65% CONCENTRATION.

06900087 sampled: 01/15/90 LC50: 88.5 %
95% fid. limits: 75.5 - 111.4 %
comments: 70% MORTALITY IN FULL STRENGTH EFFLUENT

06900257 sampled: 02/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900409 sampled: 03/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01900063 sampled: 04/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

06900525 sampled: 04/16/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN 10% TEST CONCENTRATION

06900586 sampled: 05/14/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 40% MORTALITY IN FULL STRENGTH CONCENTRATION

Cyanamid Canada Inc. (Welland plant) (continued)

Sludge Rd

River Pumphouse

1st Ave Swr Sur Ditch

1st Ave Swr Ingrd

3rd Avenue Sewer

4th Avenue Sewer

5th Ave SWW Gate

5th Ave SWE Gate

Lab Sewer

Dicy Cooling Water

06900083 sampled: 01/15/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN FULL STRENGTH SAMPLE

06900523 sampled: 04/16/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN 10% & 30% TEST CONCENTRATION

Rain Gauge

Intake Water

COMPANY: Cyanamid Canada Inc. (Welland plant), Niagara Falls
(1550102)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results from eight *Daphnia magna* acute lethality toxicity tests conducted on samples from Millers Creek (#100), and Dicy Cooling Water (#1300) were submitted by Cyanamid Canada Inc. (Welland Plant) of Niagara Falls. All six samples from Millers Creek were acutely lethal to *Daphnia*, with 48 h LC50 values ranging from 20.8% to 40.6%. The two samples of Dicy Cooling Water were not acutely lethal to *Daphnia*.

Millers Cr

06891302 sampled: 12/18/89 LC50: 40.6 %
95% fid. limits: 34.8 - 47.2 %
comments: 30% MORTALITY IN 30% CONCENTRATION.

06900088 sampled: 01/15/90 LC50: 38.7 %
95% fid. limits: 30.0 - 50.0 %
comments: 100% MORTALITY IN 50% TEST CONCENTRATION

06900258 sampled: 02/12/90 LC50: 20.8 %
95% fid. limits: 17.7 - 24.4 %
comments: 30% MORTALITY IN 20% TEST CONCENTRATION

06900410 sampled: 03/19/90 LC50: 37.6 %
95% fid. limits: 32.3 - 43.6 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900526 sampled: 04/16/90 LC50: 33.8 %
95% fid. limits: 29.5 - 38.5 %
comments: 30% MORTALITY IN 30% TEST CONCENTRATION

06900587 sampled: 05/14/90 LC50: 33.9 %
95% fid. limits: 27.6 - 42.6 %
comments: 60% MORTALITY IN 50% TEST CONCENTRATION

Sludge Rd

River Pumphouse

1st Ave Swr Sur Ditch

Cyanamid Canada Inc. (Welland plant) (continued)

1st Ave Swr Ingrd

3rd Avenue Sewer

4th Avenue Sewer

5th Ave SWW Gate

5th Ave SWE Gate

Lab Sewer

Dicy Cooling Water

06900084 sampled: 01/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900524 sampled: 04/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Rain Gauge

Intake Water

COMPANY: Exolon-Esk Company of Canada Ltd., Thorold
(1640002)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for six trout bioassays, conducted on Beaver Dam Rd. Outfall effluent samples collected between December 1989 and May 1990, were provided by Exolon-Esk Company of Canada Limited. Five of the six samples were not acutely lethal to test fish. The sixth sample produced a 96 hour LC50 result of > 100 % effluent.

Outfall Beaver-Dam Rd

03890343 sampled: 12/12/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900009 sampled: 01/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900117 sampled: 02/13/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900197 sampled: 03/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single concentration test; non-lethal

03900287 sampled: 04/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

03900373 sampled: 05/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

Rain Gauge

Intake Water

COMPANY: Exolon-Esk Company of Canada Ltd., Thorold
(1640002)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results for six Daphnia magna acute lethality toxicity tests conducted on samples of Outfall at Beaver Dam Road (#100) were submitted by Exolon-Esk Company of Canada Ltd. of Thorold. Four of six samples were non-lethal and two samples had 48 h LC50s > 100%.

Outfall Beaver-Dam Rd

03890343 sampled: 12/12/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100%

03900009 sampled: 01/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900117 sampled: 02/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900197 sampled: 03/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900287 sampled: 04/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900373 sampled: 05/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Rain Gauge

Intake Water

COMPANY: Explosive Technologies Int. Ltd., North Bay
(80200)
SECTOR: Inorganic Chemical
REGION: Northeast

SUMMARY

The data for two trout bioassays, conducted on Weir Discharge effluent samples collected between December 1989 and May 1990, were provided by Explosive Technologies International Limited. Both samples were determined not acutely lethal to test fish.

Discharge at Weir

03890352 sampled: 12/12/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900196 sampled: 03/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single concentration test; non-lethal

Storm Ditch Effluent

Cooks Creek Effluent

Beaver Pond Ditch Effl

Rain. Gauge

Intake Water

COMPANY: Explosive Technologies Int. Ltd., North Bay
(80200)
SECTOR: Inorganic Chemical
REGION: Northeast

SUMMARY

Results from two Daphnia magna acute lethality toxicity tests conducted on samples from Discharge at Weir (#100) were submitted by Explosive Technologies International Ltd. of North Bay. One sample was not acutely lethal to Daphnia and the second sample had a 48 h LC50 > 100% effluent.

Discharge at Weir

03890352 sampled: 12/12/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900196 sampled: 03/13/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test--4% mort.@100%

Storm Ditch Effluent

Cooks Creek Effluent

Beaver Pond Ditch Effl

Rain Gauge

Intake Water

COMPANY: Fiberglas Canada Inc., Sarnia
(270306)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for six trout bioassays, conducted on main effluent samples collected between December 1989 and May 1990, were provided by Fiberglas Canada Incorporated. Five of the six samples were not acutely lethal. The remaining sample produced a 96 hour LC50 of > 100 % effluent. A Ministry audit sample, collected in January, also produced a 96 hour LC50 of > 100 % effluent.

Main Effluent

03890334 sampled: 12/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900008 sampled: 01/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

01900004 sampled: 01/17/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

03900106 sampled: 02/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900194 sampled: 03/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single test concentration; Non lethal

03900284 sampled: 04/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

03900394 sampled: 05/14/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 5% mortality @ 100% eff.; single conc. test

Scott Road Landfill

COMPANY: Fibreglas Canada Inc., Sarnia
(270306)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

Results for six *Daphnia magna* acute lethality toxicity tests conducted on samples of Main Effluent (#100) were submitted by Fibreglas Canada Inc. of Sarnia. Two of six samples were not acutely lethal to *Daphnia*, and three samples had 48 h LC50s > 100%. The March sample was toxic to *Daphnia*, with an LC50 of 63.7%.

An audit sample tested in the Ministry laboratory in January was non-lethal.

Main Effluent

| | | |
|------------------|-------------------|-------------------|
| 03890334 | sampled: 12/11/89 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | LC50 >100% | |
| 03900008 | sampled: 01/08/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non-lethal | |
| 02900004 | sampled: 01/17/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | MISA Audit | |
| 03900106 | sampled: 02/12/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | LC50 >100 | |
| 03900194 | sampled: 03/12/90 | LC50: 63.7 % |
| 95% fid. limits: | 48.5 - | 83.4 % slope: 5.8 |
| comments: | Lethal | |
| 03900284 | sampled: 04/09/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | LC50 >100 | |
| 03900394 | sampled: 05/14/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non lethal | |

COMPANY: General Chemical Canada Ltd., Amherstburg
(10009)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for eighteen trout bioassays, conducted on North Drain effluent, Main Drain effluent, and Intake water samples collected between December 1989 and May 1990, were provided by General Chemicals Canada Limited. All six samples of North Drain effluent were acutely lethal to the test fish. For these samples, the 96 Hour LC50s ranged from 18.8 % to 41.8 % effluent. Five of six Main Drain effluent samples were not acutely lethal to the test fish. The remaining sample produced a 96 hour LC50 of > 100 % effluent. Five of the six Intake Water samples were also non-lethal and the remaining had a 96 hour LC50 of > 100 % effluent.

North Drain

| | | | |
|----------|--------------------------------|--------|--------|
| 03890344 | sampled: 12/12/89 | LC50: | 24.2 % |
| | 95% fid. limits: 15.3 - 38.2 % | slope: | 3.2 |
| | comments: | | |
| 03900019 | sampled: 01/09/90 | LC50: | 28.3 % |
| | 95% fid. limits: 20.0 - 40.0 % | | |
| | comments: | | |
| 03900119 | sampled: 02/13/90 | LC50: | 28.3 % |
| | 95% fid. limits: 20.0 - 40.0 % | | |
| | comments: Lethal | | |
| 03900199 | sampled: 03/13/90 | LC50: | 41.8 % |
| | 95% fid. limits: 31.3 - 54.3 % | slope: | 5.9 |
| | comments: | | |
| 03900290 | sampled: 04/10/90 | LC50: | 28.3 % |
| | 95% fid. limits: 20.0 - 40.0 % | | |
| | comments: | | |
| 03900376 | sampled: 05/08/90 | LC50: | 18.8 % |
| | 95% fid. limits: 14.6 - 24.2 % | slope: | 5.5 |
| | comments: | | |

General Chemical Canada Ltd. (continued)

Main Drain

03890345 sampled: 12/12/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900020 sampled: 01/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900120 sampled: 02/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900201 sampled: 03/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single concentration test; non-lethal

03900291 sampled: 04/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

03900374 sampled: 05/08/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; 5% mort. @100%

Effluent Soda A

Rain Gauge

Intake Water

03890346 sampled: 12/12/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900021 sampled: 01/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900118 sampled: 02/13/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900200 sampled: 03/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single concentration test; non-lethal

03900292 sampled: 04/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

General Chemical Canada Ltd. (continued)

03900375 sampled: 05/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

COMPANY: General Chemical Canada Ltd., Amherstburg
(10009)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

Results for eighteen *Daphnia magna* acute lethality toxicity tests conducted on samples from three separate discharge points were submitted by General Chemical Canada Ltd. of Amherstburg. All six samples from the North Drain (#100) were acutely lethal to *Daphnia*, with LC50s between 5.8% and 8.8%. Five of six samples from the Main Drain (#200) were not acutely lethal to *Daphnia* and the March sample had an LC50 > 100%. Four of six samples of Intake Water (#600) were not acutely lethal to *Daphnia*, and one sample had an LC50 > 100%. The March sample was acutely lethal with an LC50 of 70.7%.

North Drain

| | | | |
|------------------|------------------------|--------------|-------|
| 03890344 | sampled: 12/12/89 | LC50: | 7.4 % |
| | 95% fid. limits: 6.0 - | 9.2 % slope: | 7.2 |
| comments: | | | |
| 03900019 | sampled: 01/09/90 | LC50: | 6.6 % |
| | 95% fid. limits: 5.0 - | 8.5 % slope: | 4.7 |
| comments: | | | |
| 03900119 | sampled: 02/13/90 | LC50: | 6.4 % |
| | 95% fid. limits: 5.0 - | 8.1 % slope: | 5.4 |
| comments: Lethal | | | |
| 03900199 | sampled: 03/13/90 | LC50: | 8.8 % |
| | 95% fid. limits: 6.0 - | 13.0 % | |
| comments: | | | |
| 03900290 | sampled: 04/10/90 | LC50: | 7.2 % |
| | 95% fid. limits: 5.6 - | 9.1 % slope: | 5.5 |
| comments: | | | |
| 03900376 | sampled: 05/08/90 | LC50: | 5.8 % |
| | 95% fid. limits: 4.5 - | 7.3 % slope: | 5.4 |
| comments: | | | |

Main Drain

| | | |
|----------------------|------------------------|------------|
| 03890345 | sampled: 12/12/89 | non-lethal |
| | 95% fid. limits: 0.0 - | 0.0 % |
| comments: Non-lethal | | |

General Chemical Canada Ltd. (continued)

03900020 sampled: 01/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

03900120 sampled: 02/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900201 sampled: 03/13/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900291 sampled: 04/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900374 sampled: 05/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Effluent Soda A

Rain Gauge

Intake Water

03890346 sampled: 12/12/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900021 sampled: 01/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

03900118 sampled: 02/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900200 sampled: 03/13/90 LC50: 70.7 %
95% fid. limits: 50.0 - 100.0 %
comments:

03900292 sampled: 04/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900375 sampled: 05/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

COMPANY: ICI Canada Inc., Cornwall
(390401)
(formerly CIL Inc.)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

The data for six trout bioassays, conducted on LEL-2 effluent samples collected between December 1989 and May 1990, were provided by ICI Canada Inc. All six samples were not acutely lethal to test fish.

Rain Gauge

Intake Water

Effluent in LEL-2

06891177 sampled: 12/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900023 sampled: 01/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900218 sampled: 02/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900341 sampled: 03/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900460 sampled: 04/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900570 sampled: 05/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Effluent in Manhole 15

COMPANY: ICI Canada Inc., Cornwall
(390401)
(formerly CIL Inc.)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

Results from five Daphnia magna acute lethality toxicity tests conducted on samples from Effluent in LEL-2 were submitted by ICI Canada Inc. All three samples were not acutely lethal to Daphnia magna.

Rain Gauge

Intake Water

Effluent in LEL-2

06891178 sampled: 12/05/89 LC50: 75.2 %
95% fid. limits: 68.9 - 82.1 %
comments:

06900024 sampled: 01/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900219 sampled: 02/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OBSERVED IN 48 HOURS

06900342 sampled: 03/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900461 sampled: 04/02/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

06900571 sampled: 05/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Effluent in Manhole 15

COMPANY: ICI Canada Inc., Courtright
(390203)
(formerly CIL Inc.)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for six trout bioassays, conducted on plant final effluent samples collected between December 1989 and May 1990, were provided by ICI Canada Inc. All six samples were not acutely lethal to test fish.

Plant Final

05890136 sampled: 12/27/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900020 sampled: 01/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900045 sampled: 02/21/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900069 sampled: 03/28/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900089 sampled: 04/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900121 sampled: 05/23/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Drain Ditch

Effluent Gypsu

Effluent 30" CO

Effluent 18" BL

COMPANY: ICI Canada Inc., Courtright
(390203)
(formerly CIL Inc.)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

Results for six Daphnia magna acute lethality toxicity tests conducted on samples of Plant Final Effluent (#200) were submitted by ICI Canada Inc. Five samples were not acutely lethal to Daphnia, and the remaining sample had a 48 h LC50 > 100%.

Plant Final

05890136 sampled: 12/27/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

05900020 sampled: 01/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900045 sampled: 02/21/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900069 sampled: 03/28/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900089 sampled: 04/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900121 sampled: 05/23/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Drain Ditch

Effluent Gypsu

Effluent 30" CO

COMPANY: International Minerals & Chemicals, Port Maitland
(1500008)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for six trout bioassays, conducted on final effluent samples collected between December 1989 and May 1990, were provided by International Minerals and Chemicals. One of the six samples was acutely lethal to the test fish. The 96 hour LC50 was measured to be 86.4 % effluent. Two of the six samples were non-lethal and the remaining three produced 96 hour LC50s of >100 % effluent. A Ministry audit sample was collected in February and was non-lethal.

Rain Gauge

Intake Water

Final Effluent

| | | |
|------------------|---|--------------------|
| 03890338 | sampled: 12/12/89 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | LC50 >100% | |
| 03900007 | sampled: 01/08/90 | LC50: 86.4 % |
| 95% fid. limits: | 76.1 - | 98.1 % slope: 13.3 |
| comments: | | |
| 03900134 | sampled: 02/19/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non-lethal | |
| 01900024 | sampled: 02/27/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | MOE MISA AUDIT | |
| 03900198 | sampled: 03/12/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non-lethal | |
| 03900289 | sampled: 04/09/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | LC50 >100 | |
| 03900397 | sampled: 05/14/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | 5% mortality @ 100% eff.; single conc. test | |

COMPANY: International Minerals & Chemicals, Port Maitland
(1500008)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results for six *Daphnia magna* acute lethality toxicity tests conducted on samples of Final Effluent (#300) were submitted by International Minerals and Chemicals of Port Maitland. Two of six samples were not acutely lethal to *Daphnia*, and two samples had 48 h LC50s > 100%.

An audit sample tested in the Ministry laboratory in February was non-lethal.

Rain Gauge

Intake Water

Final Effluent

03890338 sampled: 12/12/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100%

03900007 sampled: 01/08/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900134 sampled: 02/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

02900024 sampled: 02/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

03900198 sampled: 03/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900289 sampled: 04/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900397 sampled: 05/14/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

COMPANY: Liquid Carbonic Inc., Courtright
(36250306)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for three trout bioassays, conducted on South ditch effluent samples collected between December 1989 and May 1990, were provided by Liquid Carbonic Incorporated. All three samples were not acutely lethal to the test fish.

Effluent to South Ditch

08900293 sampled: 03/29/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900441 sampled: 04/26/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900593 sampled: 05/23/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Rain Gauge

Intake Water

COMPANY: Liquid Carbonic Inc., Courtright
(36250306)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

Results for three Daphnia magna acute lethality toxicity tests conducted on samples of Effluent to South Ditch (#100) were submitted by Liquid Carbonic Inc. of Courtright. All three samples were not acutely lethal to Daphnia.

Effluent to South Ditch

08900294 sampled: 03/28/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900442 sampled: 04/26/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900594 sampled: 05/23/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Rain Gauge

Intake Water

COMPANY: Liquid Carbonic Inc., Maitland
(36250108)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

The data for four trout bioassays, conducted on Main Outfall effluent samples collected between December 1989 and May 1990, were provided by Liquid Carbonic Incorporated. All four samples were not acutely lethal to the test fish.

Effluent to Main Outfall

08900161 sampled: 02/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900291 sampled: 03/28/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900401 sampled: 04/25/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900591 sampled: 05/21/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Rain Gauge

Intake Water

COMPANY: Liquid Carbonic Inc., Maitland
(36250108)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

Results for four *Daphnia magna* acute lethality toxicity tests conducted on samples of Effluent to Main Outfall (#100) were submitted by Liquid Carbonic Inc. of Maitland. Two samples were not acutely lethal to *Daphnia*, and one sample had a 48 h LC50 > 100%.

Effluent to Main Outfall

| | | |
|------------------|-------------------|--------------|
| 08900162 | sampled: 02/27/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 08900292 | sampled: 03/28/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 08900402 | sampled: 04/25/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 08900592 | sampled: 05/21/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |

Rain Gauge

Intake Water

COMPANY: Nitrochem Inc., Maitland
(1710003)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

The data for six trout bioassays, conducted on final effluent samples collected between December 1989 and May 1990, were provided by Nitrochem Incorporated. All six samples were acutely lethal to the test fish. The 96 hour LC50s ranged from 2.4 % to 8.3 % effluent. A Ministry audit sample collected in May was also lethal, producing a 96 hour LC50 of 14.1 % effluent.

Rain Gauge

Intake Water

Final Effluent

| | | | |
|----------|-------------------------|---------------|--------|
| 03890355 | sampled: 12/12/89 | LC50: | 3.2 % |
| | 95% fid. limits: 2.2 - | 4.5 % slope: | 4.2 |
| | comments: | | |
| 03900025 | sampled: 01/09/90 | LC50: | 3.1 % |
| | 95% fid. limits: 2.1 - | 4.5 % slope: | 4.4 |
| | comments: | | |
| 03900122 | sampled: 02/13/90 | LC50: | 8.3 % |
| | 95% fid. limits: 6.3 - | 10.8 % slope: | 5.5 |
| | comments: | | |
| 03900204 | sampled: 03/13/90 | LC50: | 3.5 % |
| | 95% fid. limits: 2.5 - | 5.0 % | |
| | comments: | | |
| 03900294 | sampled: 04/10/90 | LC50: | 2.7 % |
| | 95% fid. limits: 2.1 - | 3.5 % slope: | 6.3 |
| | comments: | | |
| 01900080 | sampled: 05/01/90 | LC50: | 14.1 % |
| | 95% fid. limits: 10.0 - | 20.0 % | |
| | comments: MISA Audit | | |
| 03900377 | sampled: 05/08/90 | LC50: | 2.4 % |
| | 95% fid. limits: 1.7 - | 3.2 % slope: | 4.7 |
| | comments: | | |

COMPANY: Nitrochem Inc., Maitland
(1710003)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

Results for six *Daphnia magna* acute lethality toxicity tests conducted on samples of Final Effluent (#400) were submitted by Nitrochem Inc. of Maitland. All six samples were acutely toxic to *Daphnia* with 48 h LC50s between 3.1% and 17.2%.

An audit sample tested in the Ministry laboratory in May had an LC50 between 30% and 60%.

Rain Gauge

Intake Water

Final Effluent

| | | | |
|------------------|------------------------------|--------|---------------|
| 03890355 | sampled: 12/12/89 | LC50: | 8.4 % |
| 95% fid. limits: | 6.9 - 10.3 % | slope: | 9.3 |
| comments: | | | |
| 03900025 | sampled: 01/09/90 | LC50: | 4.1 % |
| 95% fid. limits: | 3.4 - 4.8 % | slope: | 10.3 |
| comments: | | | |
| 03900122 | sampled: 02/13/90 | LC50: | 17.2 % |
| 95% fid. limits: | 12.0 - 24.6 % | | |
| comments: | | | |
| 03900204 | sampled: 03/13/90 | LC50: | 3.1 % |
| 95% fid. limits: | 2.6 - 3.6 % | | |
| comments: | Lethal | | |
| 03900294 | sampled: 04/10/90 | LC50: | 4.7 % |
| 95% fid. limits: | 3.5 - 6.3 % | slope: | 5.3 |
| comments: | | | |
| 02900080 | sampled: 05/01/90 | LC50: | 30.0 - 60.0 % |
| 95% fid. limits: | 0.0 - 0.0 % | | |
| comments: | MISA Audit; Low initial D.O. | | |
| 03900377 | sampled: 05/08/90 | LC50: | 6.8 % |
| 95% fid. limits: | 5.3 - 8.6 % | slope: | 5.5 |
| comments: | | | |

COMPANY: Norton Canada Inc., Niagara Falls
(1650001)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for eighteen trout bioassays, conducted on Sewer B, C and D effluent samples collected between December 1989 and May 1990, were provided by Norton Canada Incorporated. Five of the six samples collected from Sewer B were not acutely lethal to the test fish. A Ministry audit sample collected in February was also non-lethal. Four of the six Sewer C samples were non-lethal. Two samples were acutely lethal to test fish. The 96 hour LC50s were 82.8 % and 75.0 % effluent. A Ministry audit sample collected in February was non-lethal. Four of the six Sewer D samples produced 96 hour LC50s of >100 % effluent. The other two samples were non-lethal. A Ministry audit sample collected in February was determined to have been non-lethal.

Sewer A

Sewer B

03890335 sampled: 12/12/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900062 sampled: 01/23/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

01900014 sampled: 02/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

03900107 sampled: 02/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900171 sampled: 03/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test--Non-lethal

03900281 sampled: 04/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

03900364 sampled: 05/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

Norton Canada Inc. (continued)

Sewer C

03890336 sampled: 12/12/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900063 sampled: 01/23/90 LC50: 82.8 %
95% fid. limits: 73.3 - 93.4 % slope: 15.6
comments:

01900013 sampled: 02/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

03900108 sampled: 02/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900172 sampled: 03/06/90 LC50: 75.0 %
95% fid. limits: 61.4 - 91.4 % slope: 8.1
comments:

03900283 sampled: 04/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900365 sampled: 05/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Sewer D

03890337 sampled: 12/12/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100%

03900064 sampled: 01/23/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

01900015 sampled: 02/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

03900109 sampled: 02/13/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900173 sampled: 03/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test--Non-lethal

Norton Canada Inc. (continued)

03900282 sampled: 04/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

03900366 sampled: 05/08/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; 5% mort@ 100%

Storm Sewer

Rain Gauge

Intake Water

COMPANY: Norton Canada Inc., Niagara Falls
(1650001)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results for eighteen *Daphnia magna* acute lethality toxicity tests conducted on samples from three separate outfalls were submitted by Norton Canada Inc. of Niagara Falls. Three of six samples from Sewer B (#200) were not acutely lethal to *Daphnia*, and three samples had 48 h LC50s > 100%. Two of six samples from Sewer C (#300) were non-lethal, one sample had an LC50 > 100%, and three samples were acutely lethal to *Daphnia* with LC50 values between 45.1 and 100%. All six samples from Sewer D (#400) had LC50s > 100%.

Audit tests were conducted on all three outfalls in February. The sample from Sewer B was non-lethal, and the samples from Sewers C and D had LC50s > 100%.

Sewer A

Sewer B

| | | |
|------------------|-------------------|--------------|
| 03890335 | sampled: 12/12/89 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non-lethal | |
| 03900062 | sampled: 01/23/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non-lethal | |
| 02900014 | sampled: 02/06/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | MISA Audit/ | |
| 03900107 | sampled: 02/13/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | LC50 >100 | |
| 03900171 | sampled: 03/06/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | LC50 >100 | |
| 03900281 | sampled: 04/09/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | LC50 >100 | |
| 03900364 | sampled: 05/08/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non-lethal | |

Norton Canada Inc. (continued)

Sewer C

| | | |
|----------|-------------------------|----------------------|
| 03890336 | sampled: 12/12/89 | non-lethal |
| | 95% fid. limits: 0.0 - | 0.0 % |
| | comments: Non-lethal | |
| 03900063 | sampled: 01/23/90 | LC50: 49.4 % |
| | 95% fid. limits: 35.9 - | 67.8 % |
| | comments: | |
| 02900013 | sampled: 02/06/90 | LC50: >100 % |
| | 95% fid. limits: 0.0 - | 0.0 % |
| | comments: MISA Audit | |
| 03900108 | sampled: 02/13/90 | LC50: >100 % |
| | 95% fid. limits: 0.0 - | 0.0 % |
| | comments: LC50 >100 | |
| 03900172 | sampled: 03/06/90 | LC50: 45.1 % |
| | 95% fid. limits: 35.9 - | 56.6 % slope: 5.8 |
| | comments: | |
| 03900283 | sampled: 04/09/90 | LC50: 50.0 - 100.0 % |
| | 95% fid. limits: 0.0 - | 0.0 % |
| | comments: | |
| 03900365 | sampled: 05/08/90 | non-lethal |
| | 95% fid. limits: 0.0 - | 0.0 % |
| | comments: Non-lethal | |

Sewer D

| | | |
|----------|------------------------|--------------|
| 03890337 | sampled: 12/12/89 | LC50: >100 % |
| | 95% fid. limits: 0.0 - | 0.0 % |
| | comments: LC50 >100% | |
| 03900064 | sampled: 01/23/90 | LC50: >100 % |
| | 95% fid. limits: 0.0 - | 0.0 % |
| | comments: LC50 >100 | |
| 02900015 | sampled: 02/06/90 | LC50: >100 % |
| | 95% fid. limits: 0.0 - | 0.0 % |
| | comments: MISA Audit | |
| 03900109 | sampled: 02/13/90 | LC50: >100 % |
| | 95% fid. limits: 0.0 - | 0.0 % |
| | comments: LC50 >100 | |
| 03900173 | sampled: 03/06/90 | LC50: >100 % |
| | 95% fid. limits: 0.0 - | 0.0 % |
| | comments: LC50 >100 | |

Norton Canada Inc. (continued)

03900282 sampled: 04/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900366 sampled: 05/08/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

Storm Sewer

Rain Gauge

Intake Water

COMPANY: Partek Insulations Ltd., Sarnia
(20150009)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for two trout bioassays, conducted on C Water Overflow samples collected between December 1989 and May 1990, were provided by Partek Insulations Limited. Both samples were acutely lethal to the test fish. The measured 96 hour LC50s were 51.1 % and 77.4 % effluent.

E Storm Drain Effluent

West Drain Effluent

C Water Overflow

05900047 sampled: 02/26/90 LC50: 51.1 %
95% fid. limits: 41.2 - 63.5 % slope: 2.9
comments: Probit Program by J.T.Trevors (1986)

05900123 sampled: 05/28/90 LC50: 77.4 %
95% fid. limits: 69.0 - 86.7 %
comments: Alpha = 10%

Effluent R MAT Storage A

Rain Gauge

Intake Water

COMPANY: Partek Insulations Ltd., Sarnia
(20150009)
(formerly Sarnia plant)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for two Daphnia bioassays conducted on C water Overflow samples collected between December 1989 and May 1990 were provided by Partek Insulations Ltd. Both samples were acutely lethal to Daphnia. The LC50s were 19.6 % and 33.5 %.

E Storm Drain Effluent

West Drain Effluent

C Water Overflow

05900047 sampled: 02/26/90 LC50: 19.6 %
95% fid. limits: 18.1 - 21.3 % slope: 6.8
comments: Probit Program by J.T.Trevors

05900123 sampled: 05/28/90 LC50: 33.5 %
95% fid. limits: 27.0 - 41.4 %
comments: Alpha = 10%

Effluent R MAT Storage A

Rain Gauge

Intake Water

COMPANY: Stanchem, Cornwall
(391508)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

The data for six trout bioassays, conducted on Conpac effluent samples collected between December 1989 and May 1990, were provided by Stanchem. Four of the six samples were acutely lethal to the test fish. The 96 Hour LC50s ranged from 14.0 %, sampled in December, to >100 % effluent, sampled in March.

Effluent from Conpac

06891179 sampled: 12/05/89 LC50: 14.0 %
95% fid. limits: 10.0 - 20.0 %
comments: 100% MORTALITY IN 20% CONCENTRATION.

06900027 sampled: 01/08/90 LC50: 16.7 %
95% fid. limits: 12.5 - 20.8 % slope: 6.6
comments: 60% MORTALITY IN 20% CONCENTRATION.

06900222 sampled: 02/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900345 sampled: 03/06/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 20% MORTALITY IN FULL STRENGTH EFFLUENT

06900458 sampled: 04/03/90 LC50: 18.6 %
95% fid. limits: 15.6 - 22.1 %
comments: 50% MORTALITY IN 20% TEST CONCENTRATION

06900566 sampled: 05/08/90 LC50: 90.6 %
95% fid. limits: 0.0 - 0.0 %
comments: CONFIDENCE LIMITS ARE UNRELIABLE

Rain Gauge

Intake Water

COMPANY: Stanchem, Cornwall
(391508)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

Results for six *Daphnia magna* acute lethality toxicity tests conducted on samples of Effluent from Compac (#100) were submitted by Stanchem of Cornwall. The February sample had a 48 h LC50 > 100%. The remaining five samples were acutely lethal to *Daphnia* with LC50s between 11.5% and 36.3%.

Effluent from Compac

06891180 sampled: 12/05/89 LC50: 18.6 %
95% fid. limits: 15.6 - 22.1 %
comments: 50% MORTALITY IN 20% CONCENTRATION.

06900026 sampled: 01/08/90 LC50: 27.4 %
95% fid. limits: 19.8 - 41.0 %
comments: 20% MORTALITY IN 5% CONCENTRATION.

06900223 sampled: 02/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN 50% TEST CONCENTRATION.

06900346 sampled: 03/06/90 LC50: 36.3 %
95% fid. limits: 31.1 - 41.9 %
comments:

06900459 sampled: 04/03/90 LC50: 11.5 %
95% fid. limits: 8.4 - 15.1 % slope: 4.9
comments: 50% MORTALITY IN 10% CONCENTRATION.

06900567 sampled: 05/08/90 LC50: 25.6 %
95% fid. limits: 23.5 - 27.9 %
comments: 90% MORTALITY IN 30% TEST CONCENTRATION

Rain Gauge

Intake Water

COMPANY: Sulco Chemicals Ltd., Elmira
(85750008)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for six trout bioassays, conducted on final effluent samples collected between December 1989 to May 1990, were provided by Sulco Chemicals Limited. All six samples were not acutely lethal to the test fish. A Ministry audit sample collected in January produced a 96 hour LC50 result of > 100 % effluent.

Final Effluent

| | | |
|------------------------------|-------------------|--------------|
| 08890482 | sampled: 12/18/89 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 01900002 | sampled: 01/10/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: MISA audit sample. | | |
| 08900051 | sampled: 01/18/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 08900131 | sampled: 02/21/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 08900231 | sampled: 03/21/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 08900421 | sampled: 04/25/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 08900581 | sampled: 05/23/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |

Storm Effluent

COMPANY: Sulco Chemicals Ltd., Elmira
(85750008)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results for six Daphnia magna acute lethality toxicity tests conducted on samples of Final Effluent (#100) were submitted by Sulco Chemicals Ltd. of Elmira. Four of six samples were not acutely lethal to Daphnia, and one sample had a 48 h LC50 > 100%. The April sample was acutely lethal to Daphnia with an LC50 of 70%.

An audit sample tested in the Ministry laboratory in January was not acutely lethal to Daphnia.

Final Effluent

| | | |
|------------------|------------------------------|--------------|
| 08890481 | sampled: 12/18/89 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 02900002 | sampled: 01/10/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | MISA Audit/high conductivity | |
| 08900052 | sampled: 01/18/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 08900132 | sampled: 02/21/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 08900232 | sampled: 03/21/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 08900422 | sampled: 04/25/90 | LC50: 70.0 % |
| 95% fid. limits: | 69.9 - | 69.9 % |
| comments: | | |
| 08900582 | sampled: 05/23/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |

UCAR Carbon Canada Ltd. (continued)

03900169 sampled: 03/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test--Non-lethal

03900256 sampled: 04/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single concentration test; non lethal

03900359 sampled: 05/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

Pump House Return Effl

03890316 sampled: 12/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

01890290 sampled: 12/13/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

03900002 sampled: 01/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900095 sampled: 02/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900170 sampled: 03/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test--Non-lethal

03900257 sampled: 04/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single concentration test; non lethal

03900360 sampled: 05/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

Union St Drain Effluent

Waste Disposal Effluent

COMPANY: UCAR Carbon Canada Ltd., Welland
(380204)
(formerly Union Carbide Inc.)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for fifteen trout bioassays, conducted on # 2 weir effluent, Government Dock effluent, Pump House Return effluent samples collected between December 1989 and May 1990, were provided by UCAR Carbon Canada Ltd. All nine samples from the # 2 weir effluent and the Government Dock effluent were not acutely lethal. A Ministry audit sample collected in December from the Government Dock effluent was also determined non-lethal. Five of the six samples of Pump House Return effluent was non-lethal, while the sixth sample produced a 96 hour LC50 result of > 100 % effluent. A Ministry audit sample collected in December was also non-lethal to the test fish.

#2 Weir Effluent

03900003 sampled: 01/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900255 sampled: 04/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single concentration test; non lethal

Government Dock Effluent

03890317 sampled: 12/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

01890289 sampled: 12/13/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

03890373 sampled: 12/18/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900004 sampled: 01/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900096 sampled: 02/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

COMPANY: UCAR Carbon Canada Ltd., Welland
(380204)
(formerly Union Carbide Inc.)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results from fifteen Daphnia magna acute lethality toxicity tests conducted on samples from three separate outfalls were submitted by UCAR Carbon Canada Limited. Two samples from the #2 Weir Effluent (#100) were not acutely lethal to Daphnia. Four of seven samples of Government Dock Effluent (#200) were non-lethal, and three samples had 48 h LC50s > 100%. All six samples of Pump House Return Effluent (#300) were non-lethal.

Ministry audits of Government Dock Effluent and Pump House Return Effluent indicated these samples were not acutely lethal to Daphnia.

#2 Weir Effluent

03900003 sampled: 01/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900255 sampled: 04/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single concentration test; non lethal

Government Dock Effluent

03890317 sampled: 12/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02890289 sampled: 12/13/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

03890373 sampled: 12/18/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900004 sampled: 01/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900096 sampled: 02/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

UCAR Carbon Canada Ltd. (continued)

03900169 sampled: 03/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900256 sampled: 04/02/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900359 sampled: 05/07/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

Pump House Return Effl

03890316 sampled: 12/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02890290 sampled: 12/13/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

03900002 sampled: 01/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900095 sampled: 02/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900170 sampled: 03/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900257 sampled: 04/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non lethal

03900360 sampled: 05/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Union St Drain Effluent

Waste Disposal Effluent

COMPANY: Union Carbide Canada Ltd., Moore TWP
(381608)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for four trout bioassays, conducted on final effluent samples collected between December 1989 and May 1990, were provided by Union Carbide Canada Limited. All three samples were not acutely lethal to the test fish.

Final Effluent

08900181 sampled: 02/28/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900261 sampled: 03/26/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900453 sampled: 04/30/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900603 sampled: 05/28/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

Rain Gauge

Intake Water

COMPANY: Union Carbide Canada Ltd., Moore TWP
(381608)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

Results for four Daphnia magna acute lethality toxicity tests conducted on samples of Final Effluent (#100) were submitted by Union Carbide Canada Ltd. of Moore Township. All four samples were not acutely lethal to Daphnia.

Final Effluent

08900182 sampled: 02/28/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900262 sampled: 03/26/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900452 sampled: 04/30/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900604 sampled: 05/28/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Rain Gauge

Intake Water

COMPANY: Union Carbide Canada Ltd., Sarnia
(381509)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for four trout bioassays, conducted on Cole Drain effluent samples collected between December 1989 and May 1990, were provided by Union Carbide Canada Limited. The sample collected in April was acutely lethal to the test fish. The 96 hour LC50 was 80.6 % effluent. Two of the four samples produced 96 hour LC50s of > 100 % effluent. The fourth sample was non-lethal to the test fish.

Effluent to Cole Drain

08900183 sampled: 02/28/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

08900271 sampled: 03/26/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900451 sampled: 04/30/90 LC50: 80.6 %
95% fid. limits: 80.6 - 80.6 %
comments:

08900601 sampled: 05/28/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

Effluent from Cole Vap.

Rain Gauge

Intake Water

COMPANY: Union Carbide Canada Ltd., Sarnia
(381509)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

Results for four Daphnia magna acute lethality toxicity tests conducted on samples of Effluent to Cole Drain (#100) were submitted by Union Carbide Canada Ltd. of Sarnia. The March sample had a 48 h LC50 > 100%. The remaining samples were toxic to Daphnia with LC50s between 43.1% and 74% effluent.

Effluent to Cole Drain

08900184 sampled: 02/28/90 LC50: 74.0 %
95% fid. limits: 52.3 - 143.0 % slope: 3.0
comments:

08900272 sampled: 03/26/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

08900454 sampled: 04/30/90 LC50: 43.1 %
95% fid. limits: 35.4 - 54.7 % slope: 8.1
comments:

08900602 sampled: 05/28/90 LC50: 73.3 %
95% fid. limits: 51.6 - 149.3 % slope: 2.9
comments:

Effluent from Cole Vap.

Rain Gauge

Intake Water

COMPANY: Union Carbide Canada Ltd., Sault Ste. Marie
(381202)
SECTOR: Inorganic Chemical
REGION: Northeast

SUMMARY

The data for four trout bioassays, conducted on samples of effluent discharging to Outfall at SD collected between December 1989 and May 1990, were provided by Union Carbide Canada Limited. All four samples were not acutely lethal to the test fish.

Effluent to Outfall at SD

08900191 sampled: 03/01/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900251 sampled: 03/26/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900471 sampled: 04/30/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900605 sampled: 05/28/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Rain Gauge

Intake Water

COMPANY: Union Carbide Canada Ltd., Sault Ste. Marie
(381202)
SECTOR: Inorganic Chemical
REGION: Northeast

SUMMARY

Results from four Daphnia magna acute lethality toxicity tests conducted on samples of Effluent to Outfall at SD (#100) were submitted Union Carbide Canada Ltd. of Sault Ste. Marie. Three samples were not acutely lethal to Daphnia, and one sample had a 48 h LC50 > 100% effluent.

Effluent to Outfall at SD

| | | |
|------------------|-------------------|--------------|
| 08900192 | sampled: 03/01/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 08900252 | sampled: 03/26/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 08900472 | sampled: 04/30/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |
| 08900606 | sampled: 05/28/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | | |

Rain Gauge

Intake Water

COMPANY: Washington Mills Electro Minerals, Niagara Falls
(1660000)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for twelve trout bioassays, conducted on Queen Lagoon effluent, and Old Lagoon effluent samples collected between December 1989 and May 1990, were provided by Washington Mills Electro Minerals. All twelve Queen Lagoon effluent and Old Lagoon effluent samples were not acutely lethal to the test fish.

Queen Lagoon Effluent

03890341 sampled: 12/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900006 sampled: 01/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900097 sampled: 02/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900182 sampled: 03/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single test Concentration; Non lethal

03900271 sampled: 04/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single concentration test; non lethal

03900371 sampled: 05/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

Old Lagoon Effluent

03890340 sampled: 12/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900005 sampled: 01/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900098 sampled: 02/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Washington Mills Electro Minerals (continued)

03900183 sampled: 03/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single test concentration; Non lethal

03900272 sampled: 04/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single concentration test; non lethal

03900370 sampled: 05/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal.

12" From FESIC Bldg

12" From SSTOR Bldg

21" to Pell Creek

18" Stanley Ave Sewer

10" at Manhole #1

Rain Gauge

Intake Water

COMPANY: Washington Mills Electro Minerals, Niagara Falls
(1660000)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results for twelve *Daphnia magna* acute lethality toxicity tests conducted on samples of Queen Lagoon Effluent (#100) and Old Lagoon Effluent (#200) were submitted by Washington Mills Electro Minerals of Niagara Falls. Five of six samples of Queen Lagoon Effluent were not acutely lethal to *Daphnia* and the remaining sample had a 48 h LC50 > 100%. Four of six samples of Old Lagoon Effluent were non-lethal, and one sample had an LC50 > 100%. The sample collected in April was acutely lethal to *Daphnia* with a 48 h LC50 of 95.5%.

Queen Lagoon Effluent

03890341 sampled: 12/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900006 sampled: 01/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900097 sampled: 02/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900182 sampled: 03/06/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50>100

03900271 sampled: 04/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non lethal

03900371 sampled: 05/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Old Lagoon Effluent

03890340 sampled: 12/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900005 sampled: 01/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Washington Mills Electro Minerals (continued)

03900098 sampled: 02/07/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900183 sampled: 03/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900272 sampled: 04/04/90 LC50: 95.5 %
95% fid. limits: 48.7 - 180.0 % slope: 1.3
comments:

03900370 sampled: 05/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

12" From FESIC Bldg

12" From SSTOR Bldg

21" to Pell Creek

18" Stanley Ave Sewer

10" at Manhole #1

Rain Gauge

Intake Water

COMPANY: Washington Mills Ltd., Niagara Falls
(1950005)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for six trout bioassays, conducted on final effluent samples collected between December 1989 and May 1990, were provided by Washington Mills Limited. All six samples were not acutely lethal to the test fish.

Final Effluent

03890339 sampled: 12/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900001 sampled: 01/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900099 sampled: 02/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900181 sampled: 03/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single concentration test; Non lethal

03900273 sampled: 04/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

03900372 sampled: 05/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

Storm Water

Rain Gauge

Intake Water

COMPANY: Washington Mills Ltd., Niagara Falls
(1950005)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results for six *Daphnia magna* acute lethality toxicity tests conducted on samples of Final Effluent (#100) were submitted by Washington Mills Ltd. of Niagara Falls. Four of six samples were not acutely lethal to *Daphnia* and one sample had a 48 h LC50 > 100%. The April sample was toxic to *Daphnia* with an LC50 of 85.7%.

Final Effluent

| | | |
|------------------|-------------------|--------------|
| 03890339 | sampled: 12/11/89 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non-lethal | |
| 03900001 | sampled: 01/02/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non-lethal | |
| 03900099 | sampled: 02/07/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non lethal | |
| 03900181 | sampled: 03/06/90 | LC50: >100 % |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | LC50>100 | |
| 03900273 | sampled: 04/04/90 | LC50: 85.7 % |
| 95% fid. limits: | 53.3 - 137.5 % | slope: 2.1 |
| comments: | | |
| 03900372 | sampled: 05/08/90 | non-lethal |
| 95% fid. limits: | 0.0 - | 0.0 % |
| comments: | Non-lethal | |

Storm Water

Rain Gauge

Intake Water

COMPANY: Welland Chemical Ltd., Sarnia
(18530006)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for thirteen trout bioassays, conducted on samples collected from South Lagoon effluent, # 1 Lagoon effluent, Chlorine Fill UN effluent, Alum Chloride E Wall, and Intake Water between December 1989 and May 1990, were provided by Welland Chemical Limited. Two of three South Lagoon effluent samples were acutely lethal to the test fish. The 96 hour LC50s were 77.1 % and 89.2 % effluent. A Ministry audit sample was also lethal to the test fish. The 96 hour LC50 was 64.6 % effluent. The third sample produced a LC50 result of > 100 % effluent. All three # 1 Lagoon effluent samples, along with the Ministry audit sample, were lethal to the test fish. LC50s ranged from 2.5 % to 51.4 % effluent. One of two Chlorine Fill UN effluent samples was lethal and the LC50 was 64.7 %. The other sample had a LC50 of > 100 % effluent. Both Alum Chloride E Wall samples produced LC50s of > 100 % effluent. One of two Alum Chloride W Wall samples was lethal and the LC50 was 96.0 %. The other sample was non-lethal. One Intake water sample collected in January was lethal and the 96 hour LC50 was 62.5 % effluent.

South Lagoon Effluent

| | | | |
|----------|-------------------|-----------------------|--------|
| 01900043 | sampled: 03/19/90 | LC50: | 64.6 % |
| | 95% fid. limits: | 54.2 - 77.4 % | |
| | comments: | MISA Audit | |
| 05900062 | sampled: 03/19/90 | LC50: | 77.1 % |
| | 95% fid. limits: | 70.5 - 84.4 % | |
| | comments: | | |
| 05900083 | sampled: 04/11/90 | LC50: | >100 % |
| | 95% fid. limits: | 0.0 - 0.0 % | |
| | comments: | | |
| 05900116 | sampled: 05/18/90 | LC50: | 89.2 % |
| | 95% fid. limits: | 79.6 - 100.9 % slope: | 17.0 |
| | comments: | | |

#1 Lagoon Effluent

| | | | |
|----------|-------------------|---------------|--------|
| 01900048 | sampled: 03/26/90 | LC50: | 12.3 % |
| | 95% fid. limits: | 10.3 - 14.7 % | |
| | comments: | MISA Audit | |

Welland Chemical Ltd. (continued)

05900067 sampled: 03/26/90 LC50: 3.2 %
95% fid. limits: 0.0 - 0.0 %
comments:

05900071 sampled: 04/04/90 LC50: 2.5 %
95% fid. limits: 2.0 - 3.1 %
comments:

05900108 sampled: 05/09/90 LC50: 51.4 %
95% fid. limits: 35.3 - 61.5 % slope: 7.3
comments: 100% conductivity X 10

Chlorine Fill UN Effluent

05900004 sampled: 01/09/90 LC50: 64.7 %
95% fid. limits: 55.6 - 77.1 %
comments:

05900077 sampled: 04/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

Alum Chloride E Wall

05900005 sampled: 01/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

05900075 sampled: 04/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

Alum Chloride W Wall

05900006 sampled: 01/09/90 LC50: 96.0 %
95% fid. limits: 0.0 - 0.0 %
comments:

05900076 sampled: 04/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Rain Gauge

Intake Water

05900003 sampled: 01/09/90 LC50: 62.5 %
95% fid. limits: 51.1 - 71.0 % slope: 11.8
comments:

COMPANY: Welland Chemical Ltd., Sarnia
(18530006)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

Results for thirteen *Daphnia magna* acute lethality toxicity tests conducted on samples from five separate discharge points and one intake site were submitted by Welland Chemicals Ltd. of Sarnia. All samples from all discharge points were toxic to *Daphnia*. Three samples of South Lagoon Effluent (#100) had 48 h LC50s between 66.8% and 70.7% effluent. The three samples of #1 Lagoon Effluent (#200) had LC50s between 1.7% and 70.7%. Two samples of Chlorine Fill UN Effluent (#300) had LC50s of 18% and 30.5%. Two samples from the Alum Chloride E Wall (#400) had LC50s of 30.5% and 36.1%. Two samples from Alum Chloride W Wall (#500) had LC50s of 36% and 42.7% effluent. One Intake Water (#600) sample had an LC50 of 18%.

Two audit samples were tested in the Ministry laboratory in March. Both samples were acutely lethal to *Daphnia*. The sample of South Lagoon Effluent had a 48 h LC50 between 30% and 60%, and the sample of #1 Lagoon Effluent had an LC50 between 0% and 5% effluent.

South Lagoon Effluent

| | | | |
|------------------|-----------------------------------|-------|---------------|
| 05900062 | sampled: 03/19/90 | LC50: | 66.8 % |
| 95% fid. limits: | 66.8 - 74.4 % | | |
| comments: | | | |
| 02900043 | sampled: 03/19/90 | LC50: | 30.0 - 60.0 % |
| 95% fid. limits: | 0.0 - 0.0 % | | |
| comments: | MISA Audit/very high conductivity | | |
| 05900083 | sampled: 04/11/90 | LC50: | 70.7 % |
| 95% fid. limits: | 0.0 - 0.0 % | | |
| comments: | | | |
| 05900116 | sampled: 05/18/90 | LC50: | 70.7 % |
| 95% fid. limits: | 0.0 - 0.0 % | | |
| comments: | | | |

#1 Lagoon Effluent

| | | | |
|------------------|-------------------|-------|-------|
| 05900067 | sampled: 03/26/90 | LC50: | 1.7 % |
| 95% fid. limits: | 1.1 - 2.7 % | | |
| comments: | | | |

Welland Chemical Ltd. (continued)

02900048 sampled: 03/26/90 LC50: 0.0 - 0.0 %
95% fid. limits: 0.0 - 5.0 %
comments: At 2 hrs. all immobile at >5%. Hi DO & Cond.

05900071 sampled: 04/04/90 LC50: 2.5 %
95% fid. limits: 0.0 - 0.0 %
comments:

05900108 sampled: 05/09/90 LC50: 70.7 %
95% fid. limits: 0.0 - 0.0 %
comments: 100% conductivity multiply by 10

Chlorine Fill UN Effluent

05900004 sampled: 01/09/90 LC50: 18.0 %
95% fid. limits: 0.0 - 0.0 %
comments:

05900077 sampled: 04/09/90 LC50: 30.5 %
95% fid. limits: 25.7 - 36.1 %
comments:

Alum Chloride E Wall

05900005 sampled: 01/09/90 LC50: 30.5 %
95% fid. limits: 25.7 - 36.1 %
comments:

05900075 sampled: 04/09/90 LC50: 36.1 %
95% fid. limits: 0.0 - 0.0 %
comments:

Alum Chloride W Wall

05900006 sampled: 01/09/90 LC50: 36.0 %
95% fid. limits: 0.0 - 0.0 %
comments:

05900076 sampled: 04/09/90 LC50: 42.7 %
95% fid. limits: 36.1 - 50.5 %
comments:

Rain Gauge

Intake Water

05900003 sampled: 01/09/90 LC50: 18.0 %
95% fid. limits: 0.0 - 0.0 %
comments: Duplicate LC50 36%

